7th World
Conference
on Gifted
and Talented
Children

XPANDING
WARENESS OF
REATIVE POTENTIALS
ORLDWIDE

SEVENTH WORLD
CONFERENCE
ON GIFTED AND
TALENTED CHILDREN

Utah has been a leader both in research on creative talents and in sponsoring and organizing a series of nine national and international Creativity Research Conferences among leading researchers on creativity. One hundred different persons were selected to present their research on creativity at one or more of the nine conferences which averaged about fifteen researchers per conference. In addition to the large volumes published on these conferences, "Clues for Creative Teaching," written by a Utah professor, were the featured series of ten articles for the full school year in *The Intructor* magazine, widely circulated and read in our nation. These research, implementation, and publication accomplishments have been part of the many subtle underlying reasons why creativity has become a frequently used word and concept during the last half of this century. From this history of searching and researching and implementing creative talents, which Toynbee called the history-making talents in his speech in Utah, we are happy to have the 7th World Conference convene here with the theme of "Expanding Awareness of Creative Potentials" worldwide and with the focus on developing gifted, talented, and creative children. The people in Utah are attending en masse to welcome other people from around the world to join in this rich exchange of ideas, methods, and findings to activate and cultivate more of the full inborn potentials of children, youth, and adults everywhere. Our conference's emphasis on creativity is in tune with Thurstone's early book, *The Vectors of Mind*, and with Guilford's two latest books titled *Way Beyond the I.Q.* and *Creative Talents*.

<div align="right">

Calvin W. Taylor — University of Utah
Chairman & Editor, 7th World Conference

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Description of the Logo

All people everywhere are endowed by our Creator with particular and individual talents and gifts. Expanding our awareness of these creative potentials is a vital and noble endeavor. The graphic symbol of the 7th World Conference on Gifted and Talented Children unifies a back-to-back pair of 7's creating a figure of a child, printed in orange representing neither sex nor race, but all children everywhere. The child figure is positioned in a background shape of green, representing growth and the indefinite and limitless boundaries of creativity.

<div align="right">

Timothy C. Sheppard
Artist & Cover Designer

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Our logo illustrates that the Orange People on Earth should have equal opportunity to all other people around the world to grow and develop fully their total creative resources.

President Bush has recently signed a law in the United States of America that the "1990's is the Decade of the Brain."

By emphasizing Creative Potentials, this new volume is strongly in tune with making the "1990's the Decade of the Brain" by searching for and developing in people the great variety of potentials in their important Brain Talent-Powers.

Books Available From:

Brain Talent-Powers Press
P.O. Box 9008, Salt Lake City, UT, U.S.A. 84109-0008

Books Also Available From:

Trillium Press, Inc.
P.O. Box 921, Madison Square Station, New York, NY, U.S.A. 10159

EXPANDING AWARENESS OF CREATIVE POTENTIALS WORLDWIDE

Edited by

Calvin W. Taylor
Chairman, Seventh World Conference
University of Utah

*Slogan: To find Assets in all students and
to develop Human Resources in all people.*

THE WORLD COUNCIL FOR GIFTED AND TALENTED CHILDREN

The World Council for Gifted and Talented Children is the overall sponsor and overseer of the series of World Conferences on Gifted and Talented Children. The World Council works in association with these conferences which have been held every two years, the odd-numbered years, since 1975. The World Council was officially organized after the first conference had been held. The series of nine World Conferences held to date and with two future sites already committed to be held in this century are listed below:

1st — 1975 London	8th — 1989 Sydney
2nd — 1977 San Francisco	9th — 1991 The Hague
3rd — 1979 Jerusalem	10th — 1993 Toronto
4th — 1981 Montreal	11th — 1995
5th — 1983 Manila	12th — 1997
6th — 1985 Hamburg	13th — 1999
7th — 1987 Salt Lake	

Membership in the World Council also brings the *WORLD GIFTED* Newsletter of the World Council for Gifted and Talented Children plus the *GIFTED INTERNATIONAL* Journal, Trillium Press, Publisher, New York. For further information on membership, materials, and other services, please write to:

World Council for Gifted and Talented Children
HMS 412, University of South Florida
Tampa, FL 33620

7TH WORLD CONFERENCE ORGANIZATION

CONFERENCE EXECUTIVE COMMITTEE

Calvin Taylor, Chair University of Utah	Jay Monson, Vice Chair Utah State University	Ivan Muse, Vice Chair Brigham Young University
Keith Steck, Vice Chair Utah State Office of Education	Jeanette Misaka Local Arrangements University of Utah	Sally Todd Program Coordinator Brigham Young University
Ann Larson Program Coordinator Utah State University	Ray Moore Committee Secretary Brigham Young University	

SECRETARIAT

Oakley Gordon
Claire Turner
Bette Cavin
Division of Continuing Education
University of Utah

ADVISORY COMMITTEE

Oral Ballam Utah State University	Carol Browning Arts and Humanities	Robert Garff Utah State Legislature
Bruce Griffin Utah State Office of Education	Darlene Gubler Parent Teacher Association	Jack Higbee Utah Vocational Council
Cecil Miskel University of Utah	Ralph Smith Brigham Young University	Reed Spencer Utah Association for Gifted Children
Walter Talbot Former Utah Superintendent of Schools	James Welch American Express	

OTHER CONFERENCE WORKERS

Pat Davis	Loma Prince	Xan Johnson
Clive Romney	Malinda St. James	Catherine Stoneman
Christine Timothy	Shirley Bunker	Elaine Iwasaki
Sandra Kikuchi	Connie Love	Joyce Gardner
Ann Sasich	Carol Lynn Ross	Pam Bleazard

Nadine Stupeli
Sherry Wasden
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Bonnie Peterson
George Welch
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Shannon Nishi
Jane Abe
Miriam Waterman
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Sheila Powell

CO-SPONSORING INSTITUTIONS

University of Utah
Hosting Institution

Utah State Office of Education

Brigham Young University

Utah State University

Salt Lake Community College

Utah Valley Community College

Utah Advisory Council for
Vocational Education

Salt Lake Convention &
Visitors Bureau

*These institutions all submitted letters supporting our proposal for the 7th World Conference site. They all also contributed up-front money needed to launch the intial work on organizing and advertising the conference.

LETTERS SUPPORTING PROPOSAL FOR 7TH CONFERENCE SITE

Scott Matheson, Governor
State of Utah
Salt Lake City, Utah 84114

Norman H. Bangerter, Governor-elect
State of Utah
Salt Lake City, Utah 84114

Ted L. Wilson, Mayor
Salt Lake City Corporation
Salt Lake City, Utah 84111

Mike Stewart, Chairman
Salt Lake County Commission
Salt Lake City, Utah 84111

Fred S. Ball, President
Salt Lake Area Chamber of Commerce
Salt Lake City, Utah 84111

Arvo Van Alstyne, Commissioner
Utah System of Higher Education
Salt Lake City, Utah 84180

Arch Madsen, President
Bonneville International Corporation
Broadcast House
Salt Lake City, Utah 84180

Donna Davies
Utah State PTA President
Salt Lake City, Utah 84102

Leon Peterson, President
Utah Business Consortium
For the Gifted and Talented
Salt Lake City, Utah 84111

Gene Berry
Coordinator of School Volunteers
Salt Lake City School District
Salt Lake City, Utah 84111

DEDICATION

To my wife, Dorothy, and our children, Craig, Stephen, and Nancy and their spouses and families, for their continuing support and interest and their sustained patience during the project's full six years: two years in successfully producing our team's final proposal which won the 1987 site; two for organizing and running the 7th World Conference; and two to produce this new pathcreating book about valuing, searching for, and tapping tremendous human potentials world-wide.

Also dedicated to Robert Frost, in whose footsteps I once stood. He was the Commencement speaker when his granddaughter, Robin Fraser, graduated from Eastern Montana College in Billings. Years later I also gave the Commencement speech there, introduced by President Stanley Heywood. Afterwards, among others, I had lunch with President Heywood and with Mayor Willard Fraser of Billings, Robert Frost's son-in-law and Robin's father.

When faced with taking a less travelled way, some will consider it less safe and less sound and will take the more traditional way. This choice, however, could have them miss invaluable opportunities along the newer route. Robert Frost treated this phenomenon very well in *"The Road Not Taken"*:

> Two roads diverged in a wood, and I —
> I took the one less travelled by,
> And that has made all the difference.

Robert Frost's above lines sparked and catalyzed a new, sequential thought. By using "path" in place of "road" and by restating this thought a multitude of times, it finally became expressed as *"Pathcreating Rewards"*:

> A *third* path, newly envisioned,
> Though not yet blazed —
> But once it's pathcreated,
> 'Twill make all the difference
> Over the *second* path less travelled by —
> So . . . this newly created *third* path
> Will double the difference
> Over the *first* more travelled path.

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ACKNOWLEDGEMENTS

First we recognize and appreciate the all-important roles of our conference organization. One vital contributor has been Dean Oakley Gordon of the Division of Continuing Education whose help was crucial in attaching our one-shot 7th World Conference to the University of Utah's organization in a very appropriate way. He and his key staff members, Claire Turner and Bette Cavin (in memoriam, Autumn 1989) formed the main Secretariat and provided excellent service for our conference.

After we had encumbered most of our up-front moneys from the co-sponsoring institutions and needed additional funds for producing flyers and other mailing costs, Dr. Gordon was also an unsung hero. From his funds he came up with a loan of $20,000 additional up-front money. Later, as soon as we had obtained sufficient incoming funds, his Division was repaid.

Several of the co-sponsoring educational organizations contributed $3,000 each. The Salt Lake Convention and Visitors Bureau, under the leadership of Richard Davis, also made an important financial contribution of over $5,000 in-kind. These funds enabled the conference to get started and to plan for its meetings in the total convention center including the Convention Hotel in the elegant Hotel Utah, its next-to-last conference before it closed its operations as a hotel.

The Technical and Vocational organizations in the public schools and the two Technical Colleges were interested in a world-first strand for Technical Vocational programs and for highly talented students in those Applied Technology areas. Collectively they contributed to recruit $3,500 as up-front money from Technical/Vocational organizational funds. It is planned for this important new strand to continue in the 8th and 9th World Conferences in Sydney and in The Hague.

Our conference team certainly appreciated the co-sponsoring organizations who contributed the up-front money totaling $15,500 in cash plus in-kind contributions. After the conference was over and had become a break-even money organization, they were then paid back their up-front monies.

The time and efforts provided gratis by the Executive Committee and total Executive Board were all-important to the success of what proved to be a very large venture. The three hardest workers of all

who functioned under our Executive Committee as program coordinators and arrangers of local events were Sally Todd, Ann Larson, and Jeanette Misaka. Among the many educational administrators who provided services to our conference team, the five who stood out the most are President Stanford Cazier, President O. D. Carnahan, Vice President Lucille Stoddard, Dean Ralph Smith, and Dean Oakley Gordon.

All who helped in the World Council Executive Committee, in our 7th Conference team and in the total conference effort are highly commended for their efforts and their generous contributions of time.and so are their families who undoubtedly provided much support to enabled them attend and participate.

All conference program presenters are also congratulated for their contributions and in nearly all cases, for coming to the conference on their own expenses. Those who submitted papers into this book are thanked and are being rewarded through having their messages sent to many parts of the world. No honorarium was paid to any of the conference speakers. Nonetheless, we attracted top speakers, three or more told us that they typically received an honorarium of one or more thousand dollars.

We appreciated the willingness of TAG and NAGC for allowing us to mail our conference announcements to all on their mailing list. Through Barbara Clark's leadership, a new NAGC strand of different topics was produced across our conference program.

Those working with program coordinators set the high tone of excitement from the Gala Opening Plenary session throughout the entire conference. These participating Utah students in the Gala Session were effectively organized and directed by Pat Davis. A number of other groups of students of practically all ages participated in dancing and musical numbers on the program and in the halls during breaks throughout the week long conference. Their expert and entertaining performances, a sustained and unusual feature of any educational conference, were welcomed by all conference attendees. The parents of their students are commended for all their efforts in helping their children be such an important part of the total conference program.

We are deeply indebted to Cecil Samuelson, then Dean of Medicine and now Vice-President of Health Sciences; Dominic Albo, Associate Dean of Medicine; David Compton, Dean of the College of Health; and Keith Henschen of that college for their insights and help in providing ideal facilities for me to spend the many extra months

When the slogan for Excellence in Education emerged, I could not buy nor sell it because of many insights from our creativity research conferences and from our own measurement research in creativity and education. This slogan turned out to mean Excellence in Traditional Education. So a Summer 1984 article in Gifted Child Quarterly emerged, titled "Developing Creative Excellence in Students: The Neglected History-Making Ingredient Which Would Keep our Nation From Being at Risk". An important sub-section was written on Traditional Excellence vs. Creative Excellence vs. Encouraging both Simultaneously. Education can be improved considerably by adding positive creative changes and by retaining the best of traditional education.

The trouble-shooting processes in Creative Excellence, which involve trouble-location and trouble-correction, can decrease educational problems and add the development of high-level Brain talent-powers. Through history-making creative methods, human programs can be well-designed with people in mind. Therefore,

> By developing creative talent-powers,
> Human effectiveness can increase,
> Thereby strengthening Wellness and Peace
> —along with Peace of Mind—
> With all approaches well-designed
> To bring out the best in all mankind.

From insights and evidences in creativity research, we are convinced of the importance and soundness of focusing on developing the multiple creative potentials hidden in students everywhere. We are pleased that the World Council for Gifted and Talented Children exists and provided our 7th World Conference the opportunity to produce this volume for many nations.

So farewell, dear books, as you fly on the winds of the world to spread fresh hopes and new opportunities vital to developing creativity in all people. Wherever you land, may you spark those people to activate and energize their Brain talent-powers, with a synergistic aim of struggling upwards towards better lives than most of them had ever dreamed of in the past.

Calvin W. Taylor, Chairman & Editor   August 1989
College of Health, Building 505
University of Utah
Salt Lake City, Utah 84112

PREFACE

Gifted, Talented, Creative, and Leadership programs, such as those presented in the 7th World Conference, can be viewed in at least three ways. *First*, as a collective set of programs, they make a diversity of contributions as they work with and develop the children and youth covered in their programs. *Second*, many of these programs provide serious new attempts that could be called explorations and experimentations toward the improvement of education, a generally officially-unrecognized contribution. And *third*, as certain programs innovate and create new paths and processes and thereby demonstrate that they work successfully, such programs are sufficiently ready and *could be implemented* into other special programs for other types of students or *even into educational programs for all students*. In fact the theme of the 4th World Conference in Montreal on *many views of the gifted and talented for the advantage of all children* covers both the second and third points above.

Unfortunately, such programs have hardly ever or have never been recognized or supported financially for this *second* type of contribution or for the *third* type by funding implementations into new settings or by rewarding such implantations already accomplished. Nonetheless, many new and effective ways have been found and used for students in programs for gifted, talented, creative, and leadership. From the more than 300 billion dollars spent annually for education in the United States, funding of even very modest amounts has *generally* not yet been obtained for these second and third types of improved educational accomplishments by programs reported in this book.

The story of this 7th World conference began on a July 1983 trip to New York City (one month before Manila's 5th World Conference). Kathy Schell of our city's Convention Center found the opportunity to bid to be the site for the 7th (1987) World Conference. Milton Gold of the World Council's Secretariat suggested that they "contact Cal to work with them since he knew about and had participated in their series of World Conferences." After being on the program at the 2nd (1977) World Conference in San Francisco, I caught a needed ride to Sacramento with Robert Swain, during which I learned that he was the chairman of that 2nd conference. We never dreamed then that we would eventually have that type of experience in common.

At the 4th Conf. (1981) in Montreal I attracted Dr. Luis Alberto Machado to attend and meet me there. He was the Minister for the Development of (Total) Intelligence in the Venezuelan President's cabinet. When we first entered the conference hallway, he was immediately recognized by Levcho Zdravchev from Bulgaria and by others he had met in his worldwide traveling. After Edward de Bono and the two of us had lunch, de Bono let Machado give a speech during part of his full afternoon session. Zdravchev had his Bulgarian team videotape Machado (and then me). Bruce Shore and his staff, alertly sensed that Machado was very newsworthy and quickly had reporters from Montreal, London and elsewhere write articles about him to the world.

I had created a Montreal session by recruiting the Canadian author of *The Ulyssean Adult* (which Lowell Bennion and I had reviewed for *Psychology Today*) to make a presentation just before mine. Aurora Roldan, the designated chairperson for the 5th (1983) Conference in Manila, attended our session. After the 4th conference I helped her recruit for her Manila 5th Conference Jean Houston, a top speaker in the entire conference series. This completes my experiences with the World Council and its Conference series before we discovered the opportunity to bid for the 7th World Conference site.

With Kathy Schell, Pete Kutulas, and Virginia Anderson of our Convention Bureau, we started to prepare and send proposal information to the World Council, but discovered that the Secretariat was being reorganized and relocated. After that was finished, their final proposal outline occurred and became available so that we finally *submitted an official full lengthy proposal* the last week in December, 1984.

Later in the Spring of 1985 we received a telegram from President James Gallagher notifying us that our proposal and city had won the contest to be the site for the 7th World Conference. Then President Chase Peterson of the University of Utah, the required main sponsoring educational agency, wrote a letter of acceptance to the World Council for Salt Lake City to be the 7th (1987) World Conference site. As forthcoming chairman of the 7th (1987) World Conference, I served as an ex officio member of the World Council Executive Committee and also made a presentation at the 6th (August 1985) World Conference in Hamburg.

There are four preliminary sections plus this Preface on: (1) The World Council for Gifted and Talented Children, Inc. (at the end of the 6th World Conference, Gallagher was replaced as Presi-

dent by Passow. Both Bitan from Israel and Terrassier from France went off the Executive Committee and Imison and Maier from Australia and Canada replaced them); (2) The 7th World Conference Organization including Co-Sponsoring Organizations and letters supporting the Proposal for 7th Conference Site (the other Co-sponsoring Educational Institutions are listed approximately in the sequence in which they joined this conference organization); (3) A section on reactions of selected people to the Conference theme and title of the book; and (4) The Acknowledgements.

Midway between the 6th and 7th World Conferences, a World Council site visit to Salt Lake City was made in August 1986 by President Harry Passow, by five of the six Executive Committee Members, and by the Executive Secretary, Dorothy Sisk. The site visit was thorough in this coverage, the exchanges were helpful to both the visited and the visitors, and they deemed us at that advanced time to be as ready as could be expected to finish planning and running the 1987 conference.

A tremendous amount of effort then occurred in organizing a conference, arranging for appropriate locations and specific settings in the total convention center conference and hotel facilities and collecting developing and publishing all the sessions daily in a very effective and colorful 88 page conference program. This all occurred under the three vice-chairmen and the extremely hard working team of Jeanette Misaka, Sally Todd and Ann Larsen. Such programs from preceding conferences helped in this total project, as ours might likewise assist future conferences.

In a certain sense, this is a volume of conference proceedings. In a larger, more unlimited sense, however, it is a provocative book on very implementable types of creative, innovative, and inventive improvements in education—*even undeniable major reforms*. Our post-conference flyer, which announced this forthcoming book, listed the following educational challenges to improve the personal growth of all creative, gifted, and talented students around the world:

1. *Give the highest priority to human resources* (the greatest resources) over natural resources, knowledge resources, and capital resources.
2. Needed: Effective educational policies for developing creative potentials in students.
3. Test for multiple creative-talent potentials before teaching for creative talents.

4. Have a change of heart—*focus on teaching people instead of teaching for the knowledge learned*, only temporarily, by students—and then letting forgetting reign.
5. Select new types of talent-focused teachers for developing creative talents and life competencies in all students.
6. To succeed, many dropout-prone and at-risk students need schooling focused on their talent assets rather than on their learning-and-returning of knowledge.
7. Select students into Professional Schools much more on whole-brain and whole-person functioning than on knowledge-testing and grade-getting.
8. Elected Leaders of Studentbodies and their performances continue to go unrecognized by G/T programs and by course credits and grades on official transcripts.
9. Do many High-IQ and High grade-getter students conform to existing systems so much that they tend to become *"perpetuators of the past"*?

A *first* goal was that we wanted to put a great emphasis on creativity in our conference program based upon Utah's "total track record" on creativity. Gina Ginsburg Riggs wrote President Harry Passow a letter that creativity would be a good emphasis in the next (7th) World Conference. Passow then suggested that we bring creativity in as the Theme, but not as part of the conference title. Collectively we worked on the Theme's title and its world impacts by emphasizing multiple potentials as follows: *Expanding Awareness of Creative Potentials*. We also chose this as the book's title by adding *Worldwide* at the end.

The *second* goal was to add other new features not highly focused on in the past. One was to study the students already in Technical/Vocational education to see if such programs are primarily calling for high-tech brain-powers needed to go with technical subject matter and equipment. Only secondarily did we mean that some academically gifted students should be sent to have technical courses as enrichment experiences —maybe even as remedial training for them to obtain more whole-brain and whole-person development.

There was an emphasis on world-leading inventor presenters along with descriptions of Young Inventor programs suddenly booming in U.S. classrooms. Also, whole-brain, whole-person approaches emerged together with the importance and the need for top priority of efforts focused upon untapped inner human resources, including

developing effective leadership in students. Another emphasis was to feature future awareness as an antidote to future shock.

A very important concept introduced was to have well-designed improvements in schooling that *will increase wellness and decrease illness* effects on students. Other Utah contributions by world-leading researchers provided up-to-date progress reports on the artificial heart work, including their moving now toward developing successful *Totally Implanted Artificial Hearts* (TIAH).

The *third* goal was to have a Gala session the first afternoon designed to create a spirited week-long, Rocky-Mountain-High conference full of excitement, cheerfulness and friendliness. We featured lively children and youth in a music-and-dance stage-show, vocal and piano musicals, plus a parade of banners. (These are represented in this book by excellent papers on creativity in music and on creativity in dance.) A motivational can-doer and do-doer speech was on climbing the highest mountain across seven continents, plus a special, inspirational slide show accompanying a Grand Finale.

Conferees told us that they had never seen so many energetic children and youth as we had on the program and in the halls performing during breaks throughout the conference. All of these created a lively, unifying and inspirational week-long climate of welcomeness.

We encountered many unexpected, troublesome problems that we never anticipated. Although our team included very experienced people, throughout our conference we continually had many experiences we'd never experienced before.

We appreciated all the help given to us to attract the largest single attendance of the seven world conferences. This more or less doubled the attendance at most of the previous conferences except for the 4th one in Montreal which we exceeded by over 40%. At one time we had about 1,800 registrants, but with sizable cancellations, our final official registration totaled 1,756, including 881 from Utah—Utahns were slightly more than half of the total (not counting all the elementary and secondary students and their parents who brought them). Utah had 311 more registrants than the total number from all the rest of the United States. There was some attendance from all the states in the U.S.A. except Rhode Island and from all Canadian provinces except three quite remote ones. Eighteen states in U.S.A. and three Canadian provinces each had greater attendance than all but three other countries of the 41 total nations.

One cancellation was unique. A teacher who had submitted a proposal to be on the program wrote and said that she wanted to cancel that proposal because she received another proposal which she chose to accept—a proposal of marriage. Paul Brandwein, a splendid speaker and a Victor Borge-like pianist-entertainer, cancelled early to avoid the likelihood of having to cancel later because of a serious recurring family illness.

Members of our Advisory Board helped to recruit featured speakers. Walter Talbot contributed his wide experience, wisdom, and vision to our team, along with his own most basic and fundamental speech. He also recruited two other speakers: Sterling McMurrin and T.H. (Ted) Bell, both former U.S. Commissioners of Education, with Bell also having recently been the U.S. Secretary of Education. McMurrin's paper was on "Talent and the Culture," and Bell's topic was "Needed: Effective Educational Policies for Developing Creative Potentials in Students."

Carol Browning recruited two of the five most featured daily speakers. They were Dick Bass, founder of Snowbird and the mountain climber speaker in the opening Gala plenary session; and Alwin Nikolais, highly honored internationally, especially in 1985 and in 1987, for his lifetime contributions to modern dance. He spoke in a morning plenary session and then was a director with the Ririe-Woodbury Dance Company in various dancing demonstrations in the evening. He made the point that the early "choosing" of geniuses is a tragic burdening to those so chosen and it tells all of the rest that they are not and will not become geniuses.

Vice-Chairman Keith Steck recruited Ned Herrmann to speak and present creativity slides from the world of business and industry. Herrmann now has the rare distinction of being an invited plenary speaker at successive 7th and 8th World conferences.

Jack Higbee of our Advisory Committee and Bruce Milne of South Dakota, created probably a first in-the-world strand for gifted, talented and creative students in Technical/Vocational schools and centers. Through Higbee's leadership, students were tested at the two Utah Technical (now Community) Colleges and at Area Vocational Centers for talents in creativity, leadership, academic, and the arts. Technical College students had scores equal to typical high school groups. In one Area Vocational Center half of the students sampled were above average in three or in all four of the above high-level talent scores. This is noteworthy because a remark-

able number of highly multi-talented students were found in a high-tech Vocational Center. These findings illustrate that *nothing is more complex, High-Tech, and challenging than the brain—both in its internal structures and processing and in its external potentials.* In USA the 1990s will be the "Decade of the Brain."

Benjamin Bloom was recommended by Harry Passow and we were fortunately able to obtain him as the Thursday plenary speaker. The largest single crowd occurred at Bloom's session in the Symphony Hall (which is practically the same size and seating arrangements as exist in the Kennedy Center's Symphony Hall).

On Friday, in the late morning, the final plenary (and conference) session consisted of a distinguished international panel of 12 persons, responding by "reporting backwards and looking forwards." These were Iraj Broomand and James Gallagher (former presidents of the World Council), D.T.E. Marjoram, Robert Swain, Bruce Shore, Aurora Roldan, Harald Wagner, (all chairmen or co-chairmen here in sequence, of previous conferences) plus Erika Landau, Levcho Zdravchev, Ruth Freeman, Cedric Taylor, and Sylvia Siqueria. The latter five presented current programs and future prospects in different areas of the world. This final panel plenary session is located at the end of this book.

John Raven's remarkable article is immediately before the article on the final plenary session. He says strongly that *all nations and therefore the World is at risk* if nations don't develop the talents and career competencies of their students.

Early in planning our conference we had a session on potential logos. Timothy Sheppard, a visual-designer artist took the challenge to create our colorful logo for the 7th conference in '87. Later, Sheppard designed the total cover to this book. His asymmetric arrangement of the logo on the cover represents creativeness, the book's emphasis. The artist's verbal description of the logo is located inside the front cover, along with our conference's additional statement about the logo.

At my 1967 summer creativity workshop, Arnold Toynbee, the eminent British historian, stated that *creative talents are the history making talents in any field of human endeavor.* Our conference theme, including Toynbee's historic definition of creativity, is presented on the inside front cover of his book The description of our theme was concluded as follows:

Our conference emphasis on creativity is in tune with Thurstone's early book, *The Vectors of Mind*, and with Guilford's two latest books titled *Way Beyond the IQ* and *Creative Talents*.

L.L. Thurstone also developed multiple factor analysis, which led him and his wife, Thelma, to use his factor analysis methods to identify seven "Primary Mental Abilities." These seven were later extended in his laboratory by them and their graduate students (including me) into nearly 30 vectors (abilities) or what I prefer to call talent-dimensions of the mind.

Thurstone wrote the first mathematical treatment on the vital topics of *Reliability and Validity of Tests*. J.P. Guilford also wrote extensively on psychometric methods. In addition, Guilford stood on Thurstone's shoulders by using his multiple factor analysis methods and by tremendously increasing the number of "talent-dimensions of the mind."

Guilford's Presidential speech on Creativity at the 1950 Annual Meeting of the American Psychological Association is the landmark for the beginning of serious scientific research on creativity during the second half of this century. Guilford's *S*tructure *O*f *I*ntellect (SOI) model can alternately be likened to a Periodic Table of the Mind. The model underwent a series of construction and reconstruction processes through his remarkable flexibility in conceptualizing and his marvelous versatility in naming and describing his factors and slabs.

His SOI model continually expanded and became more and more complicated as it unfolded onto several two-dimensional pages. But finally when "it folded up" into a three-dimensional model, it became more acceptable (and some apparently felt that it became increasingly simplified).

More recently he expanded his SOI model of 4x5x6 = 120 cells of Contents x Operations x Products into a new model of 5x6x6 = 180 cells. One change was his splitting of Memory into two factors, namely, Memory Recording and Memory Retention. I kept in touch, on-and-off, and here-and-there, with Dr. Guilford, including visiting him at home a few times. Consequently, I contacted him early about being on the World Conference program. Unfortunately, due to illnesses, he said he would not be able to travel and join us.

A month and a half after our 1987 conference ended, I flew to Los Angeles and phoned to visit him while there. However, his wife said that it would not be wise because it would be too frustrating for him in his very ill condition along with his poor hearing to try to have worthwhile exchanges. Consequently, they were sent a copy of our program as soon as I returned home, so she could show and explain to him the conference theme, and especially how we ended the theme with his two latest books. Shortly thereafter, he personally composed and typed a September 28th, 1987 letter to me in which he commended Thurstone as being, to him, the greatest scientist in psychology. Guilford ended his short letter as follows: *"With you for a more creative world."* Sadly for us and the world, he died at age 90, two months later on the Thanksgiving weekend.

Both Thurstone and Guilford were human measurement theorists and researchers, as well as implementors into practice. Their kinds of work raise vital questions and open the way toward expanding and changing the entire nature of the performances and characteristics of students that should be and can now be developed and measured. Their works thereby enable and facilitate major reforms and improvements in the schooling of students.

They are both mentioned again in my chapter. Very recently an invitation from Brasilia requests a chapter from me on contributions of psychology to education. In it I plan to expand considerably the contributions of Thurstone and Guilford to education.

Before the conference, we were trying to recruit special speakers without offering any of them an honorarium (but only traveling and living expenses). We never added a requirement of producing a paper afterwards, for fear it would deter them from accepting.

We had nearly 400 presentations and events *on the scheduled program* and about 775 presenters, nearly 2 presenters per event. The attendees had a dozen or more presentations from which to choose at every change of schedule. They thereby experienced having to make repeated choices between excellent opportunities at each schedule change.

This meant that from the several hundred sessions with one or more persons per session on the conference program, an abundance of papers were submitted by those who saw the daily Call-for Papers and took the initiative to meet the Call-for-Papers deadline. This large advanced set of worthy papers included practically none of the

speakers we had most featured for gifted and talented. This was also true for featured speakers we had worked hard to recruit for creativity and leadership and for futurists, technical/vocational, inventive, and other fields.

When we recruited many featured speakers in creativity, leadership, and these several other fields, we knew that nearly all of them could not be scheduled to be most central in the conference program. However, some of these speakers, less known to the total audience, have risen to become more featured in most sections of this book.

Fortunately, we finally recruited and received written papers for this book from key speakers in nearly all gifted, talented, creative, leadership, and technical/vocational areas. This required special efforts, however, because most of these featured speakers were here for only a day or two at the most. Almost all of them never saw our daily newsletters in which we announced the *Call for Papers*. Being so busy then, we failed to realize until long after the conference had ended, that many worthy papers were coming in—but not coming in were papers from the featured speakers.

A supportive mood was taken for all those who showed the initiative to submit a paper, knowing that some of them may be making a first attempt at publishing, especially "to the world." A positive approach was adopted by notifying these authors telling all of them that we would accept their paper if they would both revise and rewrite it at least once, reducing it to a much shorter length which we could afford to publish.

Furthermore, our basic research has indicated that the revision talent is a very central and vital one, both in communicating and in creating effectively. This was designed to encourage them to learn to rewrite, revise and shorten their work rather than risking its being rejected. Such an experience of complete rejection may occur on their work perhaps elsewhere later—and they can then learn to live through that.

The remaining task was to recruit as many papers as possible from the people more featured in the program while asking that each paper be kept to a reasonable length. The outcome is that this book now nearly parallels the diversity presented in almost 20 conference program strands as well as reasonably covering the new ideas and suggestions for educational improvements presented at the conference.

Guilford's ending thought in his letter, *"With you for a more creative world"*, sparked us to ask others who had given support to our

conference to write some of their thoughts about the theme of our conference, as Guilford had done. Among these forepages we have added another section on the reaction of a few highly selected other people to the conference theme and title of the book.

After broad generalized statements from a key Senator on the U.S. Senate Committee on Labor and Human Resources from which Education obtains federal funding, we next started with the Thurstones (Mrs. Thurstone is still alive). Then we added Guilford's letter and a letter from Anne Roe of Harvard. Anne did superb pioneering research work on eminent scientists and was the second one, right after Guilford, to win the American Psychological Association's Richardson Creativity Award (including a $5,000 cash prize).

Another letter was obtained from Dr. Willem J. Kolff on our campus, the Father of Artificial Organs and a second-year winner of the new Japan Prize Award (of about $280,000). He already had written an acceptance letter to speak, but then won another major award to be presented in England at the same time as our conference. He apologized to us and submitted an excellent letter about the conference theme as a substitute contribution. After these letters from basic scientists, we have added letters from national and local government and business leaders and from leaders in education.

The main part of the book has multiple sections that do not flow in a logical straight line sequence. Instead, the structure has a long center pole going upwards, with multiple branches as sections with each branch going out in a different direction while going up the pole. Each branch breaks out into a multiple dimensional fan shape of its own to provide the total structure.

In another continuing series of attempts, we tried to attract nearly 40 widely-known, unusual speakers, not counting the plenary speakers. For many of those on the list of potential speakers, we realized that we would have a low probability of success. We finally ended up with having contacted nearly 80 people and produced two equal length lists of people, one list of those who accepted and one of those who declined. *These two lists show how vast an effort was made by our conference team to obtain the final lengthy list of world-class featured speakers.*

My office spent considerable time especially in trying to reach and recruit a large majority of all of those who eventually declined as well as working on many who accepted. For example, we received two declining letters a few weeks apart from Bill Cosby. Unfortunately we were not able to attract Robert Redford, an adopted Utahn busy

filming in Africa, nor John Naisbitt, our former studentbody president known for *Megatrends* and for his "High-Tech and High-Touch" language. We successfully had exchanges with Dr. Raisa Gorbachev, a university teacher in Moscow, and President Coray Aquino but neither one was able to accept—and Kris Aquino's mother would not let Kris leave school as her substitute to be on our program.

With great help from our Ambassador to Japan, Mike Mansfield, Montana's former U.S. Senator, we tried to recruit a speech on Japan's beginning program on creativity-in-education from President Nakasone or his representative, but we never received a positive reply.

Jonas Salk and Senator Bill Bradley almost decided to come but eventually other commitments prevailed. Likewise, Edwin Land, founder, president, and research director of the Polaroid Corporation and their inventor of Polaroid cameras with rapid and continually innovative improvements, kept the decision open for months before declining. Earlier we had quoted one of his great insights from *Fortune Magazine*, April 1959, as follows:

> I find it is very important to work intensively for long hours when I am beginning to see solutions to a problem. At such times atavistic competencies seem to come welling up. You are handling so many variables at a barely conscious level that you can't afford to be interrupted. If you are, it may take a year to cover the same ground you could cover otherwise in sixty hours.

Alexi M. Matjushkin was *the first Russian speaker at any of the seven world conferences*, through invaluable help from Frank Barron and Dorothy Sisk. We also attracted important leading educators from 40 other nations in most parts of the world.

A bonus of dream-like experiences emerged when an invitation from Dr. Elizabeth Suzuki of the Suzuki Foundation asked me to preview our 7th World Conference during May 1987 in South America (my first trip below the Equator). Almost immediately after arriving in Buenos Aires, I gave a stream of speeches to different audiences, with a discerningly bright, Argentinean girl being my interpreter. We used a successive translation method by my speaking aloud briefly, then with her translating aloud. This worked remarkably well, with each successive speech turning out to be dif-

ferent because I had time between translations to think and plan where to go next and what to say. That day, an entirely new flow of ideas occurred in each successive speech, including at my last Rotary Club Speech starting after a 10:30 p.m. dinner and then going on into the night.

The second day was a large conference, along with other South American speakers and with audience members from Chile, Paraguay, Uruguay, and Argentina. After these two full days of speeches, the assignment for my translator, Maria Inez Reser, to work with me had ended so as she departed, I thanked her for her excellent work. Later after being returned to my hotel room, I unexpectedly heard myself whispering "I have lost my voice." Then I realized that I'd become a very handicapped person in a foreign land. But what I had really lost was the Spanish-speaking voice of my effective listener and efficient translator.

The next morning, four educators from Montevideo and I worked in Dr. Battro's lab where he uses computer approaches to search for hidden talent assets in brain-damaged persons. That evening, I flew to Sao Paulo (the largest city in the Southern Hemisphere) where my former student, Paulo Perisse, had made contact with Therizinha Fram who had organized a late dinner discussion meeting among several Brazilian leaders. The following day, under the leadership of Therezinha Fram and Sylvia Siqueria, I spoke to 125 educators from around Brazil. En route home, another former student, Janet Holland and her husband, met me in Rio de Janeiro between planes and drove me around mainly at twilight to see that famous scenic city.

A disappointment was that a group of U.S.A. developmental psychologists produced a national professionally-honored book, *The Gifted and Talented: Developmental Perspectives*. We invited the two editors of the book and other chapter authors to have one of them — or some other chapter author(s) — to bring the new contributions in their developmental psychology book and report them to the world through our conference. Unfortunately, no great interest in getting someone to respond positively to this opportunity was shown by any of them.

A more favorable note was that the Talents Unlimited project, built upon our totem pole concept and which we sparked into existence in Mobile, Alabama, readily qualified to be on the National Diffusion Network of the U.S. Department of Education. With the

help of the additional federal funding available in every one of our states, the Talents Unlimited teaching method was the most widely-adopted program throughout our nation during the 1987-88 year—and the project has had adoptions in 49 of our 50 states.

In the sustained Utah creativity movement we have had many expert consultants from our region and from afar to contribute earlier in one or many ways to this movement and creativity conference. Over one hundred different researchers on creativity have participated in our nine Utah sponsored research conference series on creativity. Almost countless others have presented and contributed in our 25 or more summer Creativity workshops and Talents Unlimited Creativity workshops held primarily here but also in California, Iowa, and Hawaii.

These consultants include U.S. Senators; the main founder and then director of the Kennedy Center in the Arts; the Director of our National Inventor's Council who invented the Guidance System which took the first astronauts to the moon and which was crucial in making a safe landing there; our nation's pioneer on Creativity in the Arts; "The Father of the Transistor Revolution," the author of "The Process of Education;" the "Father of Research on Stress;" etc. Brief paragraphs of highly important ideas for the world by two others, Arnold Toybee and Alberto Luis Machado, are reported at the first of the Final Plenary Panel Session at the end of the book.

As a final afterthought, we apologize for not having the forethought to invite the next two chairpersons, Maureen Robinson and Franz Monks of the 8th & 9th World Conferences in Sydney and in The Hague, to be the last speakers on the plenary panel to give a brief preview of the preliminary plans for their conferences.

Also, a tradition started once much earlier in the conference series could have been reinstated at the immediate beginning of our conference if we had discovered it earlier. The appropriate representative of the preceding conference would have opened the new conference on stage by delivering something appropriate (perhaps like a World Olympic baton) to the next conference's leader. This would be an important signal of the "change of leadership" together with the continuity of the conference series.

LETTERS FROM INDIVIDUALS
ON THE 7TH WORLD CONFERENCE THEME

It is a pleasure to congratulate the 7th World Conference on Gifted, Talented and Creative children on the publishing of the conference proceedings. Its theme, ''Expanding Awareness of Creative Potentials Worldwide,'' is also the key to our continued growth not only in Utah and the nation, but also the world community. I am pleased to note that this recognition is spreading internationally.

The ideas and energy of each participant in this conference went into making the 7th World Conference a success. The concepts that were discussed and expanded upon during the conference and that have now been put into this book will serve to guide policy makers around the world.

We must remember the importance of unlocking and using creativity in solving problems. We can not allow ourselves and our countries to be bound by traditional ways of measuring academic success without seriously considering the more important aspects of creativity and leadership. Each of us knows someone who has excelled in life and made major contributions to his community but was not a star student by traditional measures.

The great English historian Arnold Toynbee said in a speech in Utah that creative talents are history-making talents. It is important that our educational systems recognize that there are many aspects to success and that there is yet much to be done to utilize this untapped resource.

We must all join together as we approach the next century and recommit ourselves to harnessing this untapped power of creativity and leadership.

Senator Orrin G. Hatch
U.S. Senate, Washington D.C. 20510-6300

L.L. (Louis Leon) Thurstone and Thelma Gwinn Thurstone, his wife, worked closely together as a research team from 1924 until 1952. Both Thurstones had an abiding interest in creativity. Hers was displayed in her career-long activities dedicated to recognizing and developing the talents of gifted children in the public schools in Chicago and elsewhere. She also serves as a trustee of the *I*nstitute for *B*ehavioral *R*esearch *I*n *C*reativity (IBRIC), as did J.P. Guilford.

The Psychometric Laboratory at the University of North Carolina at Chapel Hill was founded by Professor L.L. Thurstone in 1952, following his retirement as a Distinguished Professor from the University of Chicago. After his death in 1955, Dr. Thelma Thurstone served as Acting Director of the Laboratory for two years. In 1967, the name of the laboratory became the L.L. Thurstone Psychometric Laboratory in honor of the founder.

L.L. Thurstone was a talented child who developed into a highly creative psychologist. As a high school student he won first prize in a geometry competition, thirty dollars, with which he purchased several items including a box Kodak which was the starting point for a lifetime of creative photography, his principal hobby.

As an engineering student at Cornell, Thurstone studied machine design and became interested in visual-motor coordination and in the human learning function. He developed a new design for a motion picture camera and projector that he demonstrated before Thomas Edison in his laboratory at East Orange, New Jersey. Upon his graduation from Cornell with a degree in mechanical engineering, he accepted an assistantship in Edison's laboratory. Thurstone later noted that "Thomas Edison seemed to have a startling fluency of ideas, which often ranged far from the immediate problem. He seemed to have an absolutely endless array of stories; very few of them were fit for publication. If problem-solving ability is to be studied scientifically and experimentally, it would be advisable to include stories of different kinds of fluency."

As a psychologist, L.L. Thurstone made seminal contributions to intelligence theory, psychometrics and the theory of psychological measurement, human learning, multiple factor analysis, primary mental abilities, the measurement of temperament, and the study of creative talents. The research on temperament and creativity continued actively after his arrival at UNC at Chapel Hill.

Again, Mrs. Thurstone, Lyle V. Jones, Director, John B. Carroll, former Director, and other staff members of the L.L. Thurstone

Psychometric Laboratory applaud and support continuing interests and activities related to the identification, understanding, and fostering of creative talents.

Letter on L.L. Thurstone by Lyle V. Jones
Director of the L.L. Thurstone Psychometric Laboratory
University of North Carolina at
Chapel Hill, Chapel Hill, NC 27599-3270

Thanks a lot for sending us the account of your monstrous Conference at your University. Your very unusual experiences in handling conferences have shown their effects.

I was touched by your mentioning me with Thurstone as pioneers in research on creative talents. You might have also mentioned Taylor and Carroll, who broke the ice on that line of research.

I have always regarded Thurstone as the greatest scientist in psychology. Too bad that he did not receive this recognition.

Having passed my 90th milestone, I attend no more conferences. I keep several doctors going at the UCLA Hospital, which I visited on three stays last year. You seem to have kept your youthful vigor.

With you for a more creative world.September 28, 1987

J. P. Guilford
509 N. Rexford Drive, Beverly Hills, CA 90210

Thanks for letting me know more of what you have been up to in the 7th World Conference. It looks as though you and your team have been very busy, indeed, and are really getting ahead with more work on creativity. Congratulations!

Since I have not been active for some years, I don't feel I can contribute anything new to the conference. But I should call your attention to a book I think persons working on the development of creative minds should find of interest. This is *Simple Curiosity*, edited by Leo Laporte and published by the University of California Press. The contents are the letters written by my husband, George Gaylord Simpson of Harvard, to his family and particularly to his sister,

Martha, beginning when he was in his teens. I don't need to remind you that he was the top man in his field of paleontology in his generation. Leo discovered his letters at the American Philosophical Society to which Martha had given them, copied and annotated them and they have made a lovely book. All of G's professional papers have gone to the Society.

Leo was doing research for some years, as he is writing a biography of my husband. When published, it will be interesting to compare it with my husband's autobiography, *Concession to the Improbable: An Unconventional Autobiography, Yale University Press.*

Best wishes for more successes in moving creativity ahead in the world.

Anne Roe
6653 East Carondelet Drive, Tucson, AZ 85710

Editor's other suggested readings:
Anne Roe (1953) *The making of a scientist.* New York: Dodd, Mead.
Anne Roe (1959) Personal problems and science. In C.W. Taylor (Ed.) *The Third (1959) research conference on the identification of creative scientific talent.* University of Utah Press, Salt Lake City, UT 84112. Also in C.W. Taylor and F. Barron (Eds.) (1963), *Scientific creativity.* New York: Wiley.
Anne Roe (1972) Maintenance of creative output through the years. In C.W. Taylor (Ed.) *Climate for creativity.* Elmsford, N.Y.: Pergamon Press.

Among the Professors of Internal Medicine in the Netherlands was one who was world famous. His name was connected with a bilirubin reaction that was used world-wide. When one of his young assistants gave him a paper, he would say, "Mr. so and so — have you secreted your article? Put it away for six months and then look at it again. It will look quite different to you then."

The other professor was Polak Daniels, my chief. He was not world famous. However, when I went to him with an article on a sub-

ject that he knew little about, he would study that subject and then give me the best possible advice. When you follow the careers of the internists the two professors have trained, the difference in their creativity is immediately apparent. We need creativity now more than ever, and we need to impress upon the creative students that they should express their views and that their voices must be heard or the Democratic process will not work.

Many years after I had created an artificial kidney, I was told that the United States could never afford to take care of its citizens in end stage renal disease. Then a creative man dialyzed himself inside the Capitol Building in Washington, D.C. A law was passed that recognized end stage renal disease as a financial catastrophic disease. Since then, Social Security pays for 80 percent of the costs of this disease.

Then I made artificial hearts, and I was told that the United States can never afford to provide artificial hearts for 35,000 to 50,000 people per year.

The more creative minds among us should clearly express that our priorities are wrong. SDI (Star Wars) was initiated without study, without consulting the Chiefs of Staff. The science writer in the White House had four days to advocate it. The Military Industrial Complex supports SDI out of self-interest. The large defense contractors have subcontractors in every voting district of the United States. SDI is scientifically unsound, practically unworkable, psychologically dangerous (it invites the first strike from the other side) and financially catastrophic.

Now is the time to tell our Congressmen and the new President where our priorities are. The Association of Concerned Scientists has written a brochure which indicates what questions we should ask our politicians. There must be a more creative solution to the world's problems than vaporization of us all.

Willem J. Kolff
Dumke Building, University of Utah
Salt Lake City, UT 84112

Physicians for Social Responsibility, 1601 Conn. Ave., N.W., Suite 800, Washington, DC 20009, International Physicians for the Prevention of Nuclear War, Inc., 225 Longwood Avenue, Boston, MA 12115

It is a pleasure to share in your concern for "Expanding the Awareness of Creative Potentials" in our gifted, talented, and creative children. We are united in the conviction that today's children are tomorrow's hope and, with guidance and inspiration, can, indeed, be the salvation of our society and world.

In the four decades since the Fulbright Program was established to foster international understanding our world has also been traumatized by terrorism. Yet, the vicious inhumanity we have witnessed brings a concomitant of determination to create a world free of conflict.

On many fronts — in the Fulbright Program and in such meetings as your 7th World Conference — we have taken strong, forward steps in our journey, and I am convinced that we will continue to progress as men and women of good will — human beings of all races and creeds and nations — travel together in hope.

It is heartening to know that your conference participants recognize that our greatest resource is found in the minds and hearts of our young people. For above and beyond the good earth and its natural resources is this magnificent reservoir of brain power found in the youth of the world who in a few years will become the leaders around the globe.

This brain power must be harnessed if it is to be truly effective toward finding solutions to social problems so that we may live more harmoniously and productively.

As we approach the dawn of a new century, the signals are clear. A gigantic task lies ahead. I congratulate you on your concern for the children who will plot our future course and on your program to develop to their highest potential those with the special gifts and talents our world so desperately needs.

I regret that I cannot be with all of you in person. 8/1/87.

Former U.S. Senator J.W. Fulbright
Hogan & Hartson, 815 Connecticut Avenue
Washington D.C. 20006-4072

Letter obtained with the assistance of Michael Fagin.

The children of this generation face educational challenges and competition on levels not even imagined only a few years ago. If they are to succeed in our modern environment, it is imperative that they learn to utilize their creative talents. I am delighted that the 7th World Conference on Gifted and Talented Children, held in Salt Lake City, focused on expanding the creative potential of gifted children. This is an exciting area for these children personally and a necessity for educators if future excellence on a state and national level is to be achieved.

These gifted, talented, and creative individuals are a valuable national treasure. Great benefits will come to society as a whole as parents and educators learn to unlock these doors to creativity. Individually, their lives will be enhanced if they live and learn at full potential.

I salute your efforts and know that the information and shared ideas that came from the conference will be valuable as both educators and parents strive to help individuals discover, utilize, and enjoy their creative potential.

Governor Norman H. Bangerter
State of Utah
Salt Lake City, UT 84114

Expanding Awareness of Creative Potentials World-wide, the theme of the recent 7th World Conference on Gifted and Talented Children, became a reality in many ways. Within the state of Utah, during preparations for the conference, successful collaboration evolved among the major universities, the Utah State Office of Education, vocational/technical schools, advisory organizations, public school teachers, and talented young students. Collaboration among these groups produced impressive and creative results as well as new friendships.

Jeffrey R. Holland
former President of Brigham Young University
Provo, UT 84602

Salt Lake and Utah were very fortunate to have the "Expanding Awareness of Creative Potentials World-wide" conference held in Salt Lake City in 1987. It is interesting that our state was selected for this conference since we have long prided ourselves on creativity, ambition, and education.

I have had several people who attended sessions of the conference indicate how pleased they were that this world-wide focus on developing creative and gifted children was held. There is a concurrence that this part of our society has been neglected, and in fact, this is a segment of our population that needs careful nurturing and assistance. Since the conference I have had the opportunity to secure articles on the subject and find that the activation and cultivation of the potentials of exceptional individuals is a fascinating topic.

The Chamber of Commerce is grateful to Calvin Taylor, the member of the Executive Board and all those who those who worked not only to bring the conference to Salt Lake City but to make certain that it was the outstanding success that it appeared to be. You are great corporate citizens and we appreciate you very much.

Fred S. Ball, President
Salt Lake Area Chamber of Commerce
Salt Lake City, UT 84111

Utah students and educators continue to benefit from the stimulating and insightful sessions of last summer's 7th World Conference on Gifted and Talented Children held in Salt Lake City. It would be difficult to measure, of course, the full impact of this five-day conference on the hearts and minds of hundreds of Utah educators participating, but to the extent that creative potential has been unleashed in teachers it should be multiplied many times over in their students.

Utah universities, colleges, and schools enroll thousands of highly creative and talented students, and I commend you and your associates for bringing this World Conference to Salt Lake City, where we were able to interact with educators from around the world concerned with the development of creative talents in students. Our greatest resource lies in human talent development, and I am pleased to see a growing emphasis on promoting the creativity and advance-

ment of gifted and talented students. It seems to me that a disproportionate share of our resources have gone toward mainstreaming those with lesser abilities. While these latter efforts are important in a democratic society, and cannot be ignored, the future economic progress of this country depends upon discovering and developing the creative potential not only of every person, but particularly of our brightest students.

I look forward to reading the published proceedings of this important conference and wish you continued success in promoting creative excellence in the future.

Commissioner Wm. Rolfe Kerr
Utah System of Higher Education
355 West North Temple, 3 Triad Center, Suite 550
Salt Lake City, UT 84180-1205

As a participant in the 7th World Conference on gifted, talented, and creative children, I would like to express appreciation for those responsible for the theme of the conference, "Expanding Awareness of Creative Potentials World-wide." I have had an interest in creativity for a long time.

That interest was whetted by reading a number of articles and reports. The first articles were penned by Dr. Calvin Taylor of the University of Utah wherein he demonstrated that there was little connection between academic careers of medical doctors and scientists; that is, academic achievement did not necessarily predict capacity for creativity in the lives of these two significant groups. Also, for a number of years the American College Testing Program focused on creativity in its annual reports. I read with care each of these reports from their inception; and based on extensive data, the leaders and researchers at ACT could report a low correlation between academic achievement and creativity, no matter how defined. These studies show that we humans are very complex with many dimensions to our capacities, talents, and general potential.

Too often, we concentrate on those talents which reflect convergent thinking—the capacity to reflect what one has seen, heard, or read. Not enough premium is placed on divergent thinking, or capac-

ity to see the unusual; to conceptualize the novel; to envision what can be, but has not been. Very often at the Bell labs, at NASA, in the medical and scientific labs of the country, breakthroughs come from those quarters from which it is least expected — from individuals who did not show high potential for academic achievement. And yet often, these are the very individuals who can see through, across, or around barriers that are impenetrable to the previously defined high achievers. The World Conference was an excellent forum within which to explore the diversity and the wonder of the human mind in operation on a grand scale; and high praise needs to be afforded to those individuals who do not conform to pre-established norms, norms which themselves reflect limited imagination and creativity.

<div align="right">

Stanford Cazier, President
Utah State University
Logan, UT 84322-1400

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It has been our pleasure to participate in a World Conference on Gifted and Talented Children. Salt Lake Community College is doing everything possible to cause our title to become a reality. Our mission statement refers to our communities and the possibilities of helping all that desire to expand their capabilities and to reach their fullest potential. We agree with the Utah State Senate Resolution wherein they state . . . "creative thinking capacity is a terrible thing to waste . . ." and wherein they also encourage innovative methods of teaching and reaching the creative and talented individuals.

We're grateful to those creative individuals who work hard to remind us of the creative talents that are not developed because of traditional methods of instruction and motivation. We look forward to being able to participate in new and innovative methodologies wherein " . . . the development of creative talents improves the likelihood of success in the world-of-work."

Therefore, may we confirm our support for such creative and gifted innovators who cause helping relationships to occur. Carl Rogers has defined *a helping-relationship* as a "relationship in which at least one of the parties has the intention of promoting the growth, development, maturity, improved functioning, improved coping with

life of the other . . ." he continues with ". . . more appreciation of, more expression of, more functional use of the latent inner resources of the individual." We are dedicated to helping relationships.

O.D. Carnahan, President
Salt Lake Community College, 4600 South Redwood Road
Salt Lake City, UT 84130

Since becoming a professor, twenty-five years ago, I have become acutely aware that learning institutions can, like other institutions, become rigid. In order to get things done we establish rules and standards and procedures to facilitate laudable goals. Usually these systems work. They get people registered, advised, tested, assigned, evaluated, and eventually credentialed.

There are times though when the systems are insensitive or even obstructive. I remember one of my faculty colleagues who was a most productive artist. It is said of him that he did not get along with the school system. An alert teacher simply let him draw all day. He never did learn much else. And he never entered a graduate program. Yet he was exceptional in creativity.

I'm not about to let every objector skip the "hoops" by merely saying, "But I'm creative." Nonetheless, I am aware that the "hoops" were not set up with creativity in mind.

Personally, I belong to the school of thought that creativity is fairly widespread. I grew up thinking the opposite. I surmised that there were about a dozen great pianists in the world, and about the same in each field, painting, sculpture, writing, science, etc. I certainly did not feel there was a chance I could ever create. I've changed my view. Insecurity, discouragement, timidity and routine can suppress fledgling attempts too easily. It's a shame to arrive at age fifty and only then dare to create.

So I applaud refreshing attempts to open the windows in our institutions, to attempt the maverick, to encourage creative individuals who need freshness, to nurture talent early, to promote diversity. It will be a rough, even lonely trail, but it is worth it.

It has been my pleasure, as I have worked throughout the United States, to often brag about resources of Utah, one of which is Calvin

W. Taylor, known here as "Mr. Creativity." And all of us in this state, as well as many throughout the nation, have benefited from his cogent resources of creativity. We have also benefited because he is an action-oriented man and has been promoting innovations in education to allow creativity to become one of our goals. Too often, creativity has suffered from bureaucracy and organization.

For twelve years I served as director of an Honors Program and became keenly interested in gifted and talented work in the public schools, so I am pleased to be among those who Dr. Taylor consults.

The 7th World Conference on creativity was a landmark for our state, and we are anxious to help its impact to continue. I am deeply concerned that the current mindset of tax rollbacks could undermine what progress has been made in gifted and talented programs at the public education level, and in honors programs at the college level.

We are very much interested in supporting efforts which aim at flexibility and stimulation for creative people.

Douglas D. Alder, President
Dixie College
St. George, UT 84770

Good times are ahead for education of the gifted, creative, and talented. This appears to be the year of funding for the "Gifted and Talented Students Education Act" in both the U.S. House and Senate. Money for gifted education is not new, but funding an educational philosophy of multiple intelligences and creative talents in the making is a very young field requiring different approaches through continuing research and development. Although now the likelihood of around $25 million as an annual appropriation is about the same expenditure allowed for gifted education some twenty years ago, at least the movement is once again back to national recognition with federal funding.

It has long been argued that education for the gifted should be by a differentiated curriculum. But if it is, does this imply that gifted students would study and know content and skills that others do not? It has long been my plea that the gifted, creative, and talented movement serves well for another purpose so it should be separately sup-

ported as a strong field-test ground, ultimately to provide better education for most other students. Research is needed to find out what parts of a differentiated approach could be put in force and to what degree across the curriculum of every school and classroom. We as yet do not know these things, yet it should be expected educators will be attempting to find out. The movement, the leaders, the teachers and students cannot enclose themselves with an isolated format appearing to others in education as an elitist group.

We have been there before and have been openly criticized. Certainly those in this field are distinctive and very important, but should not attempt going it alone. What is done in gifted classrooms should certainly be incorporated, to some degree at least, in most other learning experiences and environments. Even distinctive and differentiated, we are going to need the help of all the specialists in education to come up with more and different ideas for better learning. Answers are still not known and tremendous research efforts are needed for discovering ways to expand the potentials of all students; gifted and creative, normal and average, low and underachieving. As J.P. Guilford before his untimely death late in 1987 stated in a letter about the 7th Conference Theme, "with you for a more creative world." It is my deepest hope that the World Conferences continue, and in future years more will become known about gifted and creative potentials across expanding groups of children and adults.

Frank Williams
P.O. Box 1143, Newport, OR 97315
June 11, 1988

Editor's Note: When on leave as a faculty member in Aeronautical Engineering, San Jose State University, Frank Williams came to our campus and obtained his doctorate. While here, he helped me initiate summer creativity workshops and was co-editor with me (1966) on *Instructional Media and Creativity*, a report of the sixth (1964) Utah Creativity Research Conference. Two of William's best references are: (1) The Cognitive-Affective Interaction Model for Enriching Gifted Programs (1986) in Joseph S. Renzulli (Ed.). *Systems and Models for Developing Programs for The Gifted and Talented*. Creative Learning Press, Inc., Mansfield Center, Connecticut 06250; and (2) A Magic Circle (January/February 1988) *G.C.T.*, pp. 2-5.

I appreciate the opportunity to comment on the theme of the 7th World Conference on Gifted and Talented Children. Being a native Salt Laker and a University of Utah undergraduate, I worked with Calvin Taylor—more at that time on Architectural Psychology than on Creativity. In August, 1987, a conflict in my schedule unfortunately caused me to miss a literally world-class conference on gifted and creative education (and a visit to my family and relatives in Salt Lake).

The Conference theme, "Expanding Awareness of Creative Potentials World-wide," is especially meaningful to me. For two decades, I have been on my soapboax telling audiences of college students, teachers and parents that the most important step in becoming a more creative person is increasing "creativity consciousness"; i.e., increasing awareness of the importance of creative development for becoming a more complete, more self-actualized human being.

When often asked, "Can creativity be taught, or is one born with it?" I, of course, answer *yes* and *yes*. No amount of creativity training will create a Michaelangelo or a Da Vinci, but everyone can learn to use the creative abilities they already possess. And the most important step in using one's creative abilities is becoming more aware of one's own creative potentials.

To strengthen creativity, my book, *Creativity is Forever*, most strongly recommends (1) raising students' awareness of creativity, partly by helping them understanding the topic of creativity; (2) involving students in creative activities, such as Future Problem Solving and Odyssey of the Mind; (3) reinforcing creative traits, such as confidence, humor, adventurousness, and openness to new experiences; (4) helping students learn to use creative thinking techniques, which every creatively productive person uses, consciously or unconsciously; and (5) strengthening creative abilities via classroom exercise, for example, with brainstorming and "What would happen if . . .?" problems.

Congratulations to all of you on a fine conference. You went right to the heart of what should be a number one concern of every G/T program—raising awareness of creativity.

Gary Davis
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Presidential Addresses

Presidential Address: Expanding Awareness of Creative Potentials—An International Perspective

A Harry Passow[1]
Jacob H. Schiff, Professor of Education
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Welcoming Remarks to the 7th World Conference

As President of the World Council for Gifted and Talented Children, Inc., and in their behalf, I want to welcome you to this, our Seventh World Conference on Gifted and Talented Children. In 1975, under Henry Collis' leadership, the First World Conference on Gifted convened in London at which time it was decided that regular biennial conferences should be held, and that a World Council should be formed (which officially occurred toward the end of the Second World Conference in San Francisco, California). Since the Second Conference, other World Conferences have been held in Jerusalem, Montreal, Manila, Hamburg, and now, Salt Lake City.

It seems very appropriate that we are meeting in Salt Lake City to explore the theme, "Expanding Awareness of Creative Potentials."

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1. Passow was very active not only as President of the World Council, but also in four other sessions in the program. Copies of his other four papers can be obtained from him or from me. They are: Designing a Global Curriculum; Issues in Evaluating Curriculum for the Gifted and Talented; Advanced Placement Program and Curriculum for the Gifted; and Educating Gifted Persons who are Caring and Concerned.

More than three decades ago, starting in 1955 and continuing into this decade, nine successive University of Utah sponsored Research Conferences on "Creativity" were held under the leadership of Calvin W. Taylor. I have a copy of the volume, *Scientific Creativity: Its Recognition and Development* which consisted of papers selected from the first three Utah conferences. Frank Barron, Benjamin Bloom, Brewster Ghiselin, and E. Paul Torrance are among the contributors to that volume. Cal Taylor concluded his preface to that 1963 publication by noting:

> There has been sufficient demonstration, as illustrated in this collection of papers, that useful research has been and can be done on many different aspects of creativity, from the elementary schoolroom through the universities and into various research installations and professional activities. In fact, a great variety of study designs on a wide range of characteristics has been accomplished in the prediction, and many different attempts have been made in the education and training. Consequently, *it can no longer be said that fruitful research cannot be done on creativity.* Instead, there are now many lead to pursue at this relatively early period of serious scientific research on creativity . . . (Taylor and Barron, 1963, p. xix).

In his foreword to a 1980 publication titled *Creativity Research: International Perspective*, edited by M.K. Raina of India's National Institute of Education, J.P. Guilford wrote:

> This volume provides substantial evidence that there is indeed a "creativity movement" and that it now has nearly world-wide proportions. This is a hopeful situation, for a world population of creative problem-solvers should be more productive and happy as well as more self-confident and more tolerant and, therefore, more peaceful. It can more readily solve its increasingly complex problems . . . (p. v).

Among the objectives of the World Council for Gifted and Talented Children, Inc., are these two: "To initiate, conduct, and support research into the nature of giftedness, talents, creativity, and the education and development of gifted children; to disseminate research findings," and "To assemble, for an exchange of ideas and experience, people from all over the world interested in the gifted and talented." Today, we open a world conference during which we will

have hundreds of presentations, papers, discussions and exchanges on giftedness and the nurturing of creative potential from persons from many different nations. There are some seventeen strands which run throughout the conference with dozens of sessions scheduled within each strand. There are plenary sessions in which major figures in the field are sharing their research and thinking. In assembling here in Salt Lake City, we are all contributing to fulfilling the goals of the World Council while extending our own insights and understandings of the nurturance of creative potentials.

During the week, we all have a rich menu from which to choose and we will all have difficulty making our selections. I urge all of you, in making your choices of which sessions to attend, to keep in mind the cross-national and international nature of these World Conferences which is unique in the field of gifted and talented education so that you broaden your perspectives. And finally, I urge you to join the World Council for Gifted and Talented Children so that you can continue exchanging ideas and experiences with people from all over the world interested in the gifted and talented.

On behalf of the World Council, I want to thank the Organizing Committee of the Seventh World Conference for their tremendous efforts on behalf of gifted persons everywhere. The program which is in your hands is the result of two years of tremendous effort on the part of the people whom we will recognize at our Presidential Banquet. Take a moment now to look at their names so that you will know whom to thank for the wonderful experience you are going to have this week.

Again, welcome to this Seventh World Conference on Gifted and Talented Children. I am sure you will find it as enlightening and rewarding as the six world conferences which have preceded it.

The Presidential Address

J.P. Guilford (1980) has observed that the "needs for more and better creative thinking and production were felt more before mid-century, but it was not until after that point in time that scientific research and technological development really got off the ground" (p.v). Certainly, Guilford's "call for increased attention to the subject and his proposal for a new avenue approach to the study of this area of mental functioning provided one source of impetus toward the investigations of the nature of creative thinking" (p.v.)

By the mid-1950s, J.P. Guilford, Donald MacKinnon, Calvin Taylor, E. Paul Torrance, Alex Osborn, Sidney Parnes and others headed a number of research and development projects and centers which studied the nature of "creativity" and ways of nurturing and enhancing it. In 1958, Getzels and Jackson's application of Guilford's ideas on the structure of intellect to what they called the "highly intelligent and the highly creative adolescents" caught the attention of educators. Torrance's work aimed at creating assessment instruments and materials which would be "useful in guiding a wide range of creative talent at all age and educational levels" was well underway (1962, p. v). By the early 1960's, both practitioners and researchers saw a new era opening up with challenges to identify and nurture creative potential and productive behavior at all stages of individual development. Many agreed with MacKinnon (1959) who stated: "Our task as educators is not to recognize creative talent after it has come to expression but, either through our insight or through the use of validated predictors, to discover talent when it is still potential and to provide the educational climate and environment that will facilitate its development and expression" (p. 29).

For those captured by the possibilities of expanding awareness of creative potentials, the 1960s were heady times. By the early 1960s, there were those who argued that the research findings concerning the nature of creativity and creative talents demanded drastic reappraisals of all aspects of the teaching and learning processes — evaluation and assessment procedures, curriculum, teaching strategies, instructional materials, classroom and school organization, and staff use. While the researchers "did their thing," school staffs, teacher training personnel, and others all went to work on *teaching creativity* and *creative thinking*. They downplayed the criticisms of those who saw nothing new in these developments, who noted that *creativity*, *creative process*, and *creative thinking* were well-worn terms in any teachers lexicon and that all curriculum guides referred to the importance of "nurturing original thinking" and "providing opportunities for creative expression." Writing in 1963 about what she saw as a tendency to make the term *creativity* the shibboleth of the day, Taba cautioned that "the dynamics of this phenomenon (adoption of a theme or word as a slogan) seem to be produced by the premature conversion of an idea into a program without sufficient study of its meaning or educational implications. This method usually produces crash programs, which inevitably amount to pouring

old wine into new bottles, merely giving existing programs a new name" (p. 248.).

Mitra (1980), in the preface to a book titled *Creative Research: International Perspective*, observed:

> It is now realized that any system of education in a society should encourage creativity so that a society can be saved from stagnation and the individual also have his own fulfillment. Thus, we find creativity is entering into the curriculum of a school as well as in its evaluation. Studies are being made about the nature of creativity, how it grows, how it can be nurtured, what instruction can help its development, how it can be measured and predicted . . . (p. ix).

Since the mid-1950s, there has been a tremendous explosion in the literature on the nature and nurture of creativity and creative thinking. Guilford (1980) points out that: "Most writings . . . come under (four) major headings (1) the nature of creative thinking, (2) personal dispositions related to creativity, (3) external determiners, and (4) applications" (p. vi). Guilford observes that: "Creativity has always been associated with the arts — music, painting, designing, literature, and drama — long before creative thinking was well understood" (p. viii). Even before we understood that "creativity is related to problem-solving in general," Guilford notes, we had instituted programs "to improve skills in inventing and problem-solving, mostly in industry. Courses of training had been instituted and certain strategies and tactics in creative thinking had been taught" (p.viii). Much of our research and development efforts in this area have been aimed at understanding and nurturing creativity as an integral part of giftedness.

Reviewing the literature on "the various dimensions of creativity, its development, the mental processes that characterize it, and the conditions for cultivating it," Tannenbaum (1983) observed that "these qualities are universally revered because they represent the outer reaches of intelligent thought and action, setting humans apart from all other living creatures" (p. 243). Tannenbaum's review is organized around (1) multifacet and unifacet theories of creativity, (2) creative processes and abilities, (3) assessment of creativity, (4) fulfilling creative potential, (5) the creative personality, (6) creativity and mental health. He argues that "because it denotes rare and valued accomplishment, creativity may be regarded as synonymous

with giftedness. For after all, giftedness is reflected in productivity and performance, both of which are creative acts, rather than absorption and retention, which probably depend more heavily on other mental processes'' (p. 328).

Tannenbaum observed that "there is as much conflict and confusion about the meaning of creativity as there is about intelligence" but that the "large body of theory and research on creativity is valuable in the sense that it has alerted educators of the gifted to locate children who are proficient in divergent thinking and to emphasize these thought processes in the classroom" (p. 324).

At each of the World Conferences on Gifted and Talented Children, there have been reports on various aspects of creativity, indicating that creativity and creative thinking are the focus of considerable interest in countries around the world, developed and developing, capitalist and socialist. As Raina (1980) put it: "Celebration of creativity has become ineluctably an international pervasive reality. Whether it is considered from the viewpoints of its effects on society, or as one of the expressions of the human spirit, creativity stands out as an activity to be studied, cherished and cultivated" (p. xxi). Raina notes that both advanced countries and third world countries alike have become more concerned with the study and development of creativity, with the latters' survival depending on the creative vision encouraged and nurtured. Moreover,

> Beyond the local interest, whether individual or national, it is the increasing recognition by men in all parts of the globe that our capacity for creative thought and action may literally make all the difference in the world . . . Human creativity may prove to be the key to success or failure in man's quest for knowledge, in his journey beyond the bound of the sure and the seen, in his exploration of the unknown (p. xxi).

Some three decades ago, the Commission on Human Resources and Advanced Training (Wolfle, 1954) observed that:

> The nation as a whole profits from the fact that some people possess the ability to design a dam, to plan an automobile production line, to isolate an antibiotic, to conceive an atomic power plant, to develop high-yield hybrid corn, to compose a symphony, to settle a labor dispute.
> Creative and imaginative and inventive people work neither alone nor in a vacuum: each builds upon the work of his pred-

ecessors; each is dependent upon industrial workers, maintenance crews, farmers, clerks, and technicians; each is nourished by a favorable climate, rich natural resources, and a tradition of freedom and individual initiative . . .

Since the whole population profits from the work of its ablest members it would appear to be good business for the nation to use its brains well, just as it is good business to use well its forests, its water power, and its minerals. It is more than good business; it is a great national concern (pp. 1-2).

This condition applies to any nation and any culture, particularly those which we describe as *under-developed* or *developing*. As Rousseau (1962) observed about developing African nations,

Though international aid may assist progress, in the final instance it is the people who must desire progress, acquire the skills and know-how, and apply the back-breaking toil needed to discover and develop whatever natural resources exist . . . The catalysts of progress are the gifted few in the community, and their discovery, development, and utilization is the first national priority. In every under-developed country, potential Einsteins and Fords are herding cattle or breaking stones. To turn such men into competent and high-principled leaders of every kind—teachers, technicians, doctors, scientists, administrators—is an urgent necessity (p. 328).

Rousseau (1962) noted some time ago that "throughout Africa it is interesting that though schooling and Westernization tend to alienate the gifted from the community culturally, politically they appear one" (p. 329). How to meet this "urgent necessity" is a matter complicated by a set of related issues: What kind of balance is appropriate between the use of limited resources for providing as much education for *all* children (the "masses" as described by some sources) and developing advanced educational opportunities for the relatively "gifted few in the community?" How to identify and nurture creativity and creative thinking in school systems which hold onto traditions of rote learning and preparing good examination-takers? How to create the conditions whereby educationally developed giftedness and talent will be used for creative problem-solving to meet the urgent needs of developing nations? Rousseau (1962) stated the challenge very clearly:

In every field of human endeavor, cultural differences pervade performance; in every culture there are many who achieve useful technical competence in the new ways of life spreading over the globe, and some who can not only master but enrich this cosmopolitan culture by significant contributions; nowhere should the gifted live and die unnoticed and unused.

In today's developing world it is both humane and expedient that all people everywhere should receive unimpeded opportunities for displaying, developing, and employing their talents to the full through an education rooted in humanity and nourished by the local climate (p. 336).

What I am arguing is that from a world perspective, expanding awareness of creative potential is a complex and complicated matter on which progress has and is being made but on which we face formidable hurdles still. While the problems of talent spotting and development and talent development are difficult in so-called developed societies, they are even more so in developing nations and societies. Curle (1962) sees even the task of developing identification and selection procedures as difficult and complex. The task, for example, of designing tests for "new countries with different languages, cultural backgrounds and technologies is one which will take decades" (p. 534). In the absence of standardized tests, if reliance is a put on attainment, educators are faced with equally difficult decisions. For example, Curle (1962) asks:

How can (the educator) compare the attainment of a child with malaria or hookworm with that of one in good health; of a child suffering from malnutrition with one who is well fed; of a child compelled to work long hours with the herds or in the fields with one who has no obligations outside school; of a child from an illiterate, traditional, pre-Newtonian background with one from an educated home? He must know how many potential geniuses he is allowing to slip through the wide meshes of his selection-net. Yet even if he could spot the prodigy, how could he provide for him if he were educationally sub-normal (i.e., an underachiever) (p. 534)?

It is impossible, of course, to explore fully the barriers and facilitators of talent development in developing nations since such forces as nationalism, politics, social class and caste, economics, tribalism

and tradition, languages, technological development, resources and many others interact with educational planning and development. I have not even scratched the surface, of course. And, we certainly recognize that there are equally formidable barriers as well as facilitators to creating awareness of and nurturing creativity in developed societies as well. It is a truism that most *developed* societies do better than most *developing* societies when it comes to identifying and nurturing creativity and giftedness but all societies can improve their talent development efforts, especially amongst populations which are traditionally under-represented such as those from impoverished groups and racial/ethnic minorities.

While the developing nations constitute the majority of the world's nations, they are a minority when it comes to research and development regarding expanding awareness and nurturing of creative potential. If one is uncertain that creativity has become an international concern, *Creativity Research: International Perspective*, edited by M.K. Raina (1980), provides convincing reading. It contains 30 chapters with reports of research and activity in 17 countries as well as research summaries. In addition to the United States which, as usual, produces the largest number of studies, there are reports dealing with creativity research in countries as diverse as Japan and the U.S.S.R.; Canada and Czechoslovakia; Britain and Hungary; Ireland and India; France and Turkey; New Zealand and the Peoples Republic of China; Israel and Holland; Australia and Poland.

Raina (1980) found "the most impressive feature characterizing the area of creativity is a confluence of interests and its diversity" (p. xxv). With respect to the developing nations, he notes that they recognize the "importance of the massive talent search in the interests of the conservation and development of human sources and resources since their problems are different in character and magnitude from those of developed nations" (p. xxii). Raina (1980) concludes his introduction by noting:

> The Western approach to creativity has been mostly objective, reality-oriented, and intellectualistic. In order to arrive at a complex understanding of the creative process, the Eastern approach may also provide an insight and many worthwhile clues. Perhaps, the Eastern thinkers have more of intuitive insight, familiarity and association with creative processes, inner

processes of imagination, contemplation, and intuition. In the construction of a theory of creativity which can make deeper inroads into understanding of creative process East-West approach to creativity will be illuminating (p. xxix).

From a world perspective, we need to continue and intensify research efforts which will enhance our understanding of the nature of creativity and creative thinking as a significant component of giftedness, of ways by which such creative potential is identified so that opportunities for its development can be maximized, and of ways to facilitate talent potential becoming realized talent. We need to subject research and develop efforts to the kinds of synthesis, analysis and critique that will enable us to build better paradigms and structures. We need to explore further the differences in Eastern and Western approaches to the study of creativity so that we can acquire better insights into its nature and test alternative approaches to its nurture.

We need to inquire, as Vera John-Steiner (1985) put it, into learning how young persons "join wonder and skill, intensity and discipline, during the long trajectories of intellectual and artistic growth" and how creative individuals build "upon the continuity of human knowledge while achieving novel insights" (pp. 205-6). We need to know more about how to nurture in creative individuals the caring, compassion, and commitment so that they will apply their creative potential to the creative solutions to the problems humankind faces and not simply "do their own things." John-Steiner notes that "Creativity requires a *continuity of concern*, an intense awareness of one's active inner life combined with sensitivity to the external world" (p. 220); how is such intensity nurtured? In an ear in which science and technology dominate individual and societal existence, how do we expand the awareness of the creative potential of humanists and artists, those who give expression to values and beauty?

As we come to understand more about how creative performance differs from ordinary performance, about what conditions are conducive to creative performance, and about how these are similar and different in different societies and contexts, we will perhaps be able better to provide those conditions in schools and other educational settings. Amabile (1983), for example, suggests:

> Conditions that are most conducive to creativity include conditions free of salient extrinsic constraints on performance, conditions that encourage self-direction, and conditions where in-

trinsic reasons for engaging in activities is stressed over extrinsic reasons. Creative performance is different from ordinary performance in that it can be undermined by the offer of reward, the expectation of evaluation, and other social factors that have traditionally been seen as facilitating performance (p. 208).

In many ways, research and development in the area of creativity parallel efforts in the broader areas of giftedness and talent development, as would be expected since they are so closely related. The research has varied conceptually, qualitatively and theoretically. But it has resulted in extending our insights into the nature and nurture of creative potential.

At the First World Conference on Gifted for Gifted Children in 1975, I was concerned that creativity was being viewed as "another educational fad to be forgotten or ignored a decade or less from" then. I concluded then:

> It seems to me that if we are to comprehend the educational implications of research and development on creativity, we must re-examine our educational purposes in general and our understanding of what the school must do to nurture diverse aptitudes and abilities. No healthier prospect could confront us if a climate for creativity is our true goal. In doing this, fostering creativity among gifted children—and indeed among all children—will become an integral and meaningful activity among educators and parents . . . (Passow, 1976, p. 167).

From an international perspective, we seem to have moved in the direction of expanding the awareness of creative potential in a variety of ways—theoretically and pragmatically.

John-Steiner (1985), quotes from Bronowski's *Ascent of Man*, as follows:

> Knowledge is our destiny. Self-knowledge (an understanding of man himself) at last bring together the experience of the arts and the explanations of science, waits ahead of us . . . Above all (knowledge) is a responsibility for the integrity of what we are, primarily of what we are as ethical creatures.

She concludes: "Great art and great science are a gift of the individual to the society in which he or she is born and with which the struggling, solitary, triumphant being is inextricably joined" (p.

223). It is more "gifts" —creative performances and products in a variety of socially valuable areas in all societies and nations that we should seek as educators of the gifted and talented.

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Wolfle, D. 1954. *America's Resources of Specialized Talent*. New York: Harper and Brothers. (Editor's note: My graduate fellowship at the

University of Chicago consisted of being a teaching and research assistant to Dael Wolfle—as wise a person as I have ever met. Later he also became the full-time Executive Secretary of the *American Association* for the *Advancement* of *Science* (AAAS), a remarkable role for a psychologist to fulfill very effectively over all fields of science.)

Creativity, The Neglected History Making Resource

Needed: Effective Educational Policies for Developing Creative Potentials in Students

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U.S. Secretary of Education 1981-1985
U.S. Commissioner of Education 1974-76
Acting U.S. Commissioner of Education 1970-71
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The future of most nations rests in the talent of their people. It is essential that we identify early in life the most gifted children and provide them with the help that will bring all their potential to full fruition. We typically fail to do this. Our justified preoccupation with the disadvantaged and handicapped often obscures the great need of those with special ability. This results in a loss to society as well as the individual.

Most gifted students do fairly well in school, so their full needs often do not come to our attention. Because their problems are not so obvious we don't provide the special programs to nurture their talents. If education should strive to help each student reach his full potential, then gifted students are entitled to have a learning program that helps them reach the "outer limits" of ability.

We need leaders, inventive and creative people, and people who have powerful intellects who can solve problems and help to push back the frontiers of knowledge. This comes from our most gifted individuals, and to develop them to the utmost is to benefit all of mankind.

We live today in one global village of international commerce and trade. We live in a world of millions who strive to overcome poverty, disease, and a miserable life. We live in a world of contracting wealth and living conditions. To have the good life should, of course, be our aim. This goal will be attained only if we educate our most talented people and use their creative abilities and energies to better human life on this planet.

Finally, we must remember that many students from low income and minority homes have great promise that is seldom discovered and developed. This constitutes a great waste around the world. Too many very bright and able children live and die without making the contribution of which they would have been capable. We all know that the greatest waste of all today is human ability left hidden and undeveloped.

The big challenge to all of us is to set in motion a more comprehensive means of reaching all the giftedness and creativity that wastes away. May we all get new ideas on how to solve this big problem is my hope for this conference.

Let me add that the conference placed great emphasis on developing creativity as a crucial element in a program of educating the gifted. It was clearly indicated that creative potential exists in almost all students around the world. It is therefore appropriate to name this volume *"Expanding Awareness of Creative Potentials Worldwide."*

Development of Creative Resources in Students Demands Higher Priority Than Natural Resources and Knowledge Resources and Capital Resources

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On the Primacy of Total Inner Human Resources

America has reached unparalleled heights in economic and social development, due, in large part, to its public education system. A few years ago, I had occasion to review several studies which looked at the economic condition of some nations in the world in relation to their investment in human resources. I found that the standard of living enjoyed among these countries stood in direct relationship to the development of their human resources, not to the development of their natural resources. I rediscovered that same principle in visiting several countries in Latin America, more recently.

Those countries which had invested heavily in human development through a public education program had a higher standard of living than those which had not. In fact, with the great demand for the development of natural resources, particularly in the energy fields, countries without human resources were dependent upon foreign talent. Without foreign talent and ingenuity, countries, even with great reserves of natural resources, would not enjoy their current standard of living.

I would not, of course, claim that a public education system is the only developer of human talent. But I do not know of a better way to

develop a country than through a public education program which reaches out to all people. Economists generally agree that investment in human resources pays higher dividends than the investment in capital. The public education system provides greatest opportunity for the development of human talents and I believe that in the United States that investment has paid off.

Economic growth through a better educated populace is a worthy goal in education and would be so if it were the only goal. The Federal Government has recognized that investment in education is a good and worthwhile investment. The G.I. Bill is a prime example. The earning power alone of those educated under the G.I. Bill increased to the point that taxes paid on the increased earnings returned enough money to the Treasury to repay the investment in just a short time. Our own state rehabilitation program demonstrates the same principle daily.

But setting aside the economic growth, who can estimate the value of education in increased tolerance and empathy, in educated mothers and fathers and neighbors, in an enlightened electorate, in reduced crime, in better and safer communities, in an educated citizenry in the event of war or other national emergencies, in the fulfillment of personal ambitions, goals, and capacities.

Therefore, our search for human talents ought to have a higher priority than our search for natural resources because the development of the latter is fully dependent upon the former.

Likewise, it follows that our search for human talents should have higher priority than our search for knowledge because *the acquisition of existing knowledge and the production of new knowledge are both fully dependent upon the former.*

Search for Talents and Creativity

Within society in the United States of America, the greatest achievement and the most persistent challenge is the satisfactory education of its people. If, however, the schools and society are to carry onward in that course, the minds of educators need to expand and their practices need to reflect a continuous search for creative, innovative, and inventive ideas and directions. When the schools are being called upon to double their productivity at a time when financial resources are being halved, it is not fruitful to retrench into tradition; but, rather, it is the time to strike out boldly and to educate

the minds and hearts of students to think creatively and innovatively on their own.

A good education enables people to be free, to explore, to invent, to see matters in proper perspective and in relationship to the whole of life. The kind of education most people want and need is the kind they enjoy getting: that which stretches their mind and allows the thought processes to emerge and develop in new ways. That kind of education requires creativity and imagination not only in the learner but in the teacher and in the structure of the system as well.

All people have talents and abilities waiting to be tapped and developed. Viewed in this manner, people are seen as *assets*, not as liabilities. As we survey assets (1) we value them, (2) we want to be closely identified with them, (3) we seek to develop them to their full potential, (4) we are jealous of our relationship to them, (5) we protect them, guard them, and fight for them, (6) we rise up in fear and indignation at the first sign of any threat to them, (7) we treat them with respect and want the world to know how much we value and appreciate them.

On the other hand, we see *liabilities* in a much different way: (1) we have little use for them, (2) we want no identification with them, (3) we seek to rid ourselves of them as soon as possible, (4) we do not desire any relationship with them, (5) we curse the day we met them and we fight against them, (6) we rise up in indignation at the thought of them and threaten those who introduced us to them, (7) we have no respect for them and we do not want the world to know of our association with them.

When students, and people in general, are viewed as assets rather than liabilities, the relationship of teachers and administrators, indeed, all of society, to students and with students take on a dimension that is expansive not confining, productive not burdensome, creative not restrictive. We need to be creative in our own thinking and to teach others how to think, not just what to think, so they are not owned and anchored by things, but their minds are free to soar and their hearts are free to feel.

Our search for talents must be never-ending. Investment in people — the full development of talents — pays much higher dividends than investment in capital and in things. The higher standard of living among nations of the world, not just economically but idealistically as well, is directly related to investment in the development of people. It is, therefore, axiomatic that we should direct our

money and our effort and energy in the search for and the development of talents rather than on a search for and the development of greater capital and natural resources, for the latter are directly dependent upon the former.

Ten General Principles to Guide Us in Programs for the Creative and Gifted and Talented

1. Models of talent and creativity are needed, for there is little development in people when they have no model but themselves to follow.

2. Every person has an innate power for good; an undeveloped power for good often results in strengthening innate powers in the opposite direction.

3. Each human being, at any age, will respond to those who show an interest and unfeigned love.

4. We build self-esteem in others when we lift; we destroy it when we trample. We build self-esteem in others when they feel wanted and needed; we destroy it when they feel rejected and unvalued.

5. A person learns most quickly and lastingly that which has meaning for that person.

6. Individuals differ in all sorts of ways and their differences must be taken into account if there is to be a quantum leap in success in their lives.

7. Home and school are two inseparable influences in a student's life. The more closely these two influences can be coordinated, and the more each one utilizes the resources of the other, the better the results for the student.

8. Second rate ideas can produce phenomenal results through good administration and brilliant ideas can be smothered and even scuttled through poor administration.

9. The bitterness of poor quality will always outlast the sweetness of low cost, and that maxim may be applied to relationships with others as well as to financial matters.

10. People who think little of themselves waste great potential. Everyone is somebody. There is no such thing as an unimportant person.

Editors Note: Kelly Matthews, chief economist for First Security Corporation in Utah (for which Marriner Eccles and George Eccles were two of the three principle founders) reported that after World

Utah State Senate

Resolution

DEVELOPING CREATIVE TALENTS IN STUDENTS RESOLUTION
1988 GENERAL SESSION

S.R. No. 9   Dix H. McMullin, Haven J. Barlow

A RESOLUTION OF THE SENATE CALLING ON THE EDUCATIONAL SYSTEMS OF THE STATE TO DEVELOP CREATIVE TALENTS THROUGH APPROPRIATELY TRAINED TEACHERS.

Be it resolved by the Senate of the state of Utah:

WHEREAS, public and higher education should provide students with instruction in not only traditional academics, but also nontraditional development of creative thinking;

WHEREAS, the development of creative thinking and creative talents builds upon excellence in traditional academics;

WHEREAS, it is possible to teach students to apply their creative talents in the learning process and thereby acquire more knowledge;

WHEREAS, this classroom approach costs practically no more, once teachers are properly trained;

WHEREAS, Arnold Toynbee, the eminent British historian, indicated in a Utah Creativity Workshop that creative talents have been and continue to be the history-making talents in any field of human endeavor;

WHEREAS, the 7th World Conference on gifted, talented and creative children was held in 1987 in Salt Lake City with over half of the attendees being from Utah;

WHEREAS, the conference theme, "Expanding Awareness of Creative Potentials" sets the stage for Utah to lead the world in a resurgence of creativity;

WHEREAS, creative thinking capacity is a terrible thing to waste, such as when students use only typical academic talents in an overpracticed learning process;

WHEREAS, exploratory pilot projects that focus on testing for high-level creative talents show that there are a remarkable number of students in Utah schools with highly-creative brainpower potential;

WHEREAS, development of creative talents improves the likelihood of success in the world-of-work;

WHEREAS, noted educators have focused upon developing creative talents in every student as a solution to social and economic problems;

WHEREAS, it is the opinion of these educators that development of human talents should be a higher priority than development of natural resources or capital; and

WHEREAS, a number of educators in Utah are interested in developing creative talents in students within regular classrooms and ready to pioneer for creative talent development in Utah schools.

NOW, THEREFORE, BE IT RESOLVED that Utah initiate major educational reform by implementing the development of creative talents in its schools and by establishing creative excellence as a vital teammate with traditional academic excellence.

BE IT FURTHER RESOLVED that the Senate encourage Utah's universities and colleges to train Utah's future educators in "teaching-for-creativity" methods and urge teachers in Utah's public schools to incorporate these methods in their classrooms.

BE IT FURTHER RESOLVED that Utah's Outcome Based Educational program designate some of its projects as talent-based projects.

BE IT FURTHER RESOLVED that additional students be tested for creativity, leadership, and academic talents, and for talent in the arts.

BE IT FURTHER RESOLVED that the Senate of the state of Utah recognize the goals of the Utah creativity movement and encourage those involved to continue their work.

War II, Japan was a devastated country in many ways. But in the subsequent years, *Japan has become an economic giant. They accomplished this turnaround by maximizing their human resources,* rather than relying on their limited natural resources. Salt Lake Tribune, August 28, 1988, p. B2.

The first two heretofore unpublished sections of Talbot's writeup are (1) a summary of a talk which was initially given a decade ago and which has been used as a handout in recent years; and (2) a summary paper written recently to use as a backup page along with the first section which together formed his handout to the audience after his 7th World Conference speech. The third section is the entirely new summary of the final section of his talk. All three sections were expanded in sequence in his official speech.

For recent relevant reactions to the above recommendations on searching for creative talents, see the Utah State Senate Resolution (S.R. No. 9) at the end of this paper, calling on the educational systems of the state to develop creative talents through appropriately trained teachers.

Creative People Worldwide[1]

Genevieve W. Gore

W.L. Gore & Associates, Inc.

555 Paper Mill Road

Newark, Delaware 19714-9329

It is wonderful to be here in Salt Lake where I was born and went through school and met my husband at Westminster College.

This talk today will be about our organization, W.L. Gore & Associates. We have been in business 30 years and we have literally moved from the basement of our home to the moon. Let me start by telling you a little bit about where we are today and then go back and tell you a little bit about why we think we got where we are.

As you have heard, our business is worldwide. It has a value in the marketplace today by independent appraisers of over one billion

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1. In 1958 Wilbert L. (Bill) Gore and his wife, Genevieve (Vieve) Gore have been the founders and full and equal partners and corporate executives of W.L. Gore & Associates, Inc. One of the many accomplishments of this company is creating and developing and manufacturing their invention of Gore-Tex, a material used in medicine, electronics, and outdoor clothing and equipment. Their slogan under their logo is *Creative Technologies Worldwide*.

Unfortunately, Bill Gore died in the summer of 1986. Since then, Mrs. Gore and her daughter, Ginger Gore Geovale, gave a gift to fund the new Bill and Vieve Gore School of Business Building at the Westminster College of Salt Lake City. Chairman Robert F. Weyher and the Board of Trustees; President Charles H. Dick; the Dean of Business, Charles Ehin; and all the faculty and students who use this well functioning and beautifully designed building are very delighted by this great gift from the Gore family to Westminster College. Recently, at the conclusion of his term of office as chairman, Weyher relinquished his chairmanship to Ginger Gore Geovale.

dollars. We are a private enterprise and the company is 90% owned by its associates. We are not listed among Fortune 500 people, but we have a statistician in our organization who is just wonderful. His name is Shanti Mehta. He likes to play with figures, so he has tried to place us in the Fortune 500 categories and see just where we would come out. We have a lot of fun doing this. We are a *private* company. If we were listed as a *public* company and we were among Fortune 500 people in sales, we would be number 474 in sales. We would be listed as number 50 in Fortune 500's criteria on performance; and we are number 1 among Fortune 500 companies with regard to average total returns to investors in the last ten years. This is what makes it so much fun for us to have Shanti Mehta look at these figures and put us in some kind of line with public companies. We have a stock ownership plan and every associate that has been with us a year begins receiving four stocks.

It is significant also that we have been listed in the Addison Leslie Publishing Company's book as one of the 100 best companies in the United States to work for.

Today I have called this talk *Creative People Worldwide*. I believe that our organization is here today because the people who join our organization have a freedom to reach their creative potential capabilities.

Many of our friends thought we were very foolish when we talked about and finally decided to leave DuPont Company and to start a business of our own. Bill had a very good job with the DuPont Company. It was very satisfying to him. We didn't have any information on how to market and we didn't have a product to sell when he left DuPont. We did have five children through college. We had a mortgage on our house. And we had, if we got everything together, all of the bonuses that Bill had received that were still just paper documents from DuPont. Everything we could accumulate was about $90,000.00.

We really thought awfully hard about what we should do. We wanted to do this although it was a big risk. We had responsibilities to which we were already committed. Finally one day Bill came up with the idea and he said, "I have two questions to ask you." It has turned out that in our company we have asked ourselves these two questions on many, many of our new ventures that we are considering going into. We have to answer 'yes' to both questions.

One of the questions is, "If we fail, if we try this and it's an absolute disaster, can we stand it?" Well, we had really talked about

this a lot. And we said, Gee whiz, we are only 45 years old. We have our family. We are healthy. Bill has dug ditches before and I decided, well, I could get a job doing dishes. The DuPont Company said to Bill "we can't give you your old job back but if you don't succeed in this venture, come see us and we will see if we can find a job for you." So, to the first question we answered "yes, we could stand it."

And the second question was, "If we succeed, will it be worth it?" This is another thing we thought hard about. We talked to our children about it and they all said "Yes, yes, we are very supportive." We finally decided that if we didn't do it, we would be very sorry. The timing was right. I think in business, timing is very critical.

DuPont had developed the *polytetraflouroethylene* (PTFE) called DuPont's "Teflon," just at this point. It was ready to be marketed. Bill perceived that IBM was ready to have a high temperature conductor in some of their new computers and the materials seem to fit for what we had, so the timing was right.

On January 1, 1958, Bill and I were having breakfast together. He was out of a job and we decided that we had better go downstairs and get to work. We had lots of hopes and dreams and we had lots of confidence that we would win. So, we went to work downstairs to start a business using DuPont's Teflon. Friends and family joined us in our efforts. They came from all over.

In rereading some of our old writings that we were doing along the way, I find that we never had a doubt that we would win. It never entered our heads that we wouldn't. When Bill left the DuPont company, they gave him a paper weight and on this paperweight it says, "It doesn't matter whether you believe you will win. Whether you'll succeed or whether you will fail, you'll be right in either case." We thought we would, too.

We had a two-level house and our house is built into a hillside so when we started, the downstairs was our factory. Upstairs we had six rooms. As people joined us from across the United States and around, and as our family joined us to help us get started, our house gradually filled up. By the time our business was about a year old, we had 13 people living in the upstairs of our house. We had cots and beds absolutely everywhere. People were sleeping on the floor in sleeping bags and this sort of thing. Everything in the house was used to start our business including all of the tools in Bill's shop. We bought the other secondhand tools from my checkbook —and I'll

tell you, it is very hard to write a check on your personal checkbook for an old rusty tool.

They used all my pans and my jars and mixers. They drilled holes in my pressure cooker. They used my hair dryer. They even took my curling iron and ruined it. And my kitchen stove was used in which to bake raw materials, too. So at night when all the rest of us would go to bed, these materials were put into the oven in my kitchen stove and turned to high temperatures. By morning they would have taken them out and we could all go on with living. It wasn't very long until all of the lining from the oven was falling out. They drilled holes in the ceilings and the floors and the walls. Cars were parked all over the lawn and even my shrubs were driven over. *It was a disaster*!

But the great thing about all of this was that every single person that joined us knew we would be successful and every person did what needed to be done. If the floor needed to be swept, if a meal needed to be cooked, if a machine needed to be built, it didn't matter. Somebody did it and they worked hard and I will tell you, we worked from morning to night.

From our beginning in Delaware, Bill and I had both belonged to a lot of organizations, PTA and Lions and all sorts of different organizations in town, women's clubs and so on. We weren't able to continue doing anything like that. We dropped absolutely everything to make this company go because we had a two year time during which we just had to do everything possible or we felt we would be out of funds.

Our objective was to earn money and to have fun doing it. Bill had worked in a lot of companies before this. He enjoyed DuPont very much and he enjoyed working in a task force at DuPont that was a lot of fun. But he had worked in other companies, too, and they weren't all fun. So he decided if we have a company, we should have fun doing what we wanted to do and we still do that.

The fun part is the picnics and the Christmas parties we had and the celebrations we had when we get a patent or discovered something new or we got a big order. All these things are fun but the real fun we have and one of the things that we enjoy most is our conviction that what we are doing is important. It is important to us, it is important to our enterprise, and it is important to the people in our community.

People often ask us how we manage our 35 plants around the world in Scotland, France, Germany, India, Japan, and the United

States. Our answer is, we don't manage plants, they manage themselves. The way they do that is by following our principles and our policies.

We have our own four principles that we have developed. The first one of these principles, not necessarily the most important, but one of them is *fairness*. We absolutely have to be fair. You have to be fair to your society in which you live, your community. You have to be fair to your suppliers. You have to be fair to each other and to your customers. It is absolutely necessary. Unfairness brings resentment, anger and bad feelings. When this happens, it destroys communication and other things, so we absolutely have to be fair.

Another one of our principles is *freedom*. By freedom we mean that each of us will encourage and help each of our fellow associates to grow in his knowledge and develop in his skills and other potentials. Every innovation that we make, every risk we take, means that maybe we will fail in that particular thing. If you take a risk, you might fail, so we have to be very tolerant of mistakes.

Another one of our principles is one of *commitment*. We associates make our own commitments and we keep them. No one can make a commitment for us. If someone tells you what to do, you are being given a command and *there is a lot of difference between a command and a self commitment.*

Last, but not less important, is our *responsibility* principle which we call our *waterline decision*. We think of ourselves as all in the same boat and all of our associates can drill holes in the side of the boat above the waterline. A hole below the water line could sink us. And any action that is a serious risk to our reputation, to our financial security, or to the future opportunity of our enterprise is a waterline matter. Any such matter has to be discussed with other associates who will join in the risk of that action and if a consensus is not met, that action should *not* be taken.

The people who have joined us and work with us in the leadership that has developed among the associates is most outstanding. Leaders develop and emerge naturally within our organization. We are a lattice structure, a flat structure as opposed to a hierarchical structure. We have no titles, no bosses in our company.

My five children and their spouses are all deeply involved in working for the success of our enterprises. We welcome all of our associates to encourage family members to seek employment with us. I asked one of our leaders in our Eastern cluster to get an estimate of

how many people in our organization have relatives working with us. Just before I came here, he came back and said he estimates that about 52% of the people that work with us have relatives also working with us.

We have had some great dreams and it is wonderful to think of what you can possibly do by writing it down, thinking it out and dreaming about it. Bill Gore once said, "Of all things precious to mankind, *the freedom to dream is the ultimate value*".

A New Nine Minute Slide Show
About What We Do and What We Produce

Now, are there any questions?

Q: Mrs. Gore, how do you establish you salary rates or wage rates in your company?

A: First, we get surveys at the marketplace, so that we feel we are comparable to other companies. We work quite hard at this. In fact, it is one of things on which we work the hardest. In the different groups of people that work together, we obtain ratings on the people in that group, without any salary type of information being made available. It is very interesting because when you finally pull that rating out and put it on a graph, you find a good match with the contribution they are making. You can't do that over a very short period of time because sometimes people have bad times and sometimes people do something very special. However, over maybe a year's period of time, it levels out and it is a very fair way to do it, according to their contribution.

Q: What is the average education level with your employees. Do you have college graduates, a lot of graduates working for you?

A: When we started out, we just grabbed anybody we could get. We had a lot of part-time people because we really couldn't afford to pay people, so we were getting a lot of part-time people that had other jobs. But today we use lots of engineers—engineers with other disciplines if we can get them but we use lots of engineers. As our company is using more robotistic processing, we need less people on the lines, but we are using a lot of engineering people right now.

Q: Do you think that the education level of your associates has anything to do with the concept of the work level?

A: I think that people who are better educated know where to get information. Yes, I think that they know a lot of things, they can go a lot further. We also encourage a lot of education in our company. If any of the classes that people in Gore want to take have anything to do with our company at all, we pay for it. We don't go out and try to get people a degree in something that we are not interested in, but if what they want has anything to do with our company, we pay for their education.

Q: Do you encourage stock ownership in your company?

A: We have no stock available for sale. It is a *private company* and any of the stock that becomes available, we put into our stock ownership plan and then it is distributed to all our associates. Let me add that we don't have any employees — we only have associates.

Q: How would a person go about going to work for Gore and Associates?

A: We have people centered in Flagstaff, Arizona, including my daughter, Ginger Gore Geovale, who is here with me. Maybe she can tell you about that. Then we have a main center in Newark, Delaware where people can send in applications and be interviewed. We do quite a bit of recruiting at colleges.

Q: You are obviously one of the most successful companies using the lattice type organizational structure. What would be your opinion as to its negatives, sort of drawbacks?

A: It is very difficult for a person who has worked in a hierarchical organization to come into a lattice structure *because you have to be very mature*. If you have to be told what to do, you just don't work out in our organization. You have to see what needs to be done and you do it. What is required is a sort of self commitment and it is also a perception of what needs to be done.

Q: Using your waterline principle, who makes the decisions, including what oceans you sail around?

A: We really haven't had much of a problem on our waterline decisions. We did at one time a few years back. We had a big order and it required silver conductors. The price of silver was skyrocketing. We figured that if we didn't have enough silver in our plants to fill the orders, pretty soon we would be having real trouble because we were just going to be paying more for the silver that we were getting to manufacture our conductors than we would be able to get back.

So a whole bunch of us got together and decided that next Monday, we would buy silver and everybody dreamed in between. We got together next Monday and bought silver. Then the price started to go down and it went down, down, down. So that wasn't a very wise decision, but it shows the way in which we operate, with a consensus of opinion.

Thank you very much.

Final Commenter: Mrs. Gore, we became aware with what we see to be one of your secrets, which impresses us very much. One is that you are capable of never taking credit for anything. The second is that you do not understand the word ''I'' — you only use the word ''We''.

Bill Gore wrote that human potential is under-utilized by enterprises of society. Leaders can unleash more inherent creativity and productivity by eliminating the authoritarian aspect of organizations and by depending on commitment and natural leadership as controlling forces. The simplicity and order of an authoritarian organization make it an almost irresistible temptation. Yet is stifles individual freedom and smothers creative growth. The complexity of enterprise in today's scientific-industrial environment makes the task of maximizing human freedom and potential to be a challenging one. At Gore Associates, one of our basic principles is to encourage maximum freedom for each associate person. This has triggered an avalanche of inventions, innovations, and ways of increasing productivity and reducing costs.

Multiple Creative Talent Totem Poles: Their Uses and Transferability to Non-Academic Situations

Calvin W. Taylor, University of Utah
Darrel Allington, Granite School District, Utah
Beverly Lloyd, Jordan School District, Utah

While I was introducing Brewster Ghiselin of *The Creative Process* (1955) in another of the simultaneous presentations, Darrel Allington and Beverly Lloyd started this session. One purpose of this chapter is to honor these two teammates who have made very vital contributions to the multiple-talent teaching approach. They were the two crucial ones in producing the effective illustrations of faces in the talent totem poles which are remembered by so many. These faces in the totem poles are thereby most central in illustrating the nature of our testing and teaching programs for Multiple Creative Talents. Our programs started from basic research on creativity followed by an educational theory founded upon such basic research. Next we educationally engineered and deliberately designed for students' potentials, and then we soundly implemented the development of their potentials into classroom practices.

We consider that the *Academic Talents* demonstrate *Traditional Excellence* and *yesterday minds* by involving the learning of the "library of the past." This is in contrast with the *Creative Talents* described as *"the history making talents"* by Arnold Toynbee, the eminent British historian (1967). Development of the Creative Talents produces *Creative Excellence* that leads to improvements

which "make the future!" They also produce *tomorrow minds* that generate the new-knowledge-part of the library.

Creativity can be described both as a breakaway and as a break-open-the-way talent. Creative Talents break away from the *narrowed-mind* and the lower-level functioning of the Academic Talents and thereby break open the way into the broader and higher-level functioning of multiple brainpower talents.

Over the years in our talent training program, we have expanded the number of talent totem poles three times. Before we started teaching for multiple talents, the Academic Talents were already predominantly used in classrooms. In general, the academic talents call for learning-and-returning knowledge and passing tests on it.

Presently, the attention to this talent almost swamps classroom time. However, we now strongly believe that the primary teaching focus on the academic talents should shrink back to allow many other higher-level talents time to grow and develop. So we started by injecting a second broad, complex talent called "creativity" into both talent testing and talent teaching. This combination yielded two quite separate types, the first Academic talent totem pole and the second Creativity talent totem pole. Research analyses of talents led to the next expansion — the splitting of the creative totem pole into five new sub-components of creative talents. Retaining the academic talents, we have added the set of five other talents and have used them for a couple of decades. These six talents in their original sequence are: Academic, Productive Thinking, Planning, Communicating, Forecasting, and Decision-Making.

Years ago, Darrel Allington once watched me try to sketch talent-score profiles of two or more students across points on a series of six parallel, upward-pointing vectors. As a creative and artistic person, he produced a sketch in his own way in his notes which he showed me afterwards. He had sketched small faces with smiles and frowns going up and down across all the talent totem poles. He therefore was humanizing instead of merely using "dehumanizing points", as I was doing in sketching these important profile presentations.[1]

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1. He was also extremely versatile in having filled a tremendous variety of assignments in his school district from being expert in running media centers and creating media materials, in continually being an excellent artist and illustrator, and in successfully training teachers in different subject-matter areas each year for several years. He has generated lots of teaching materials and a tremendous collection of cards of ideas on how to teach subject matter and also how to teach students in multiple talent ways in the training of teachers, such as at my summer creativity workshops.

For many of our earliest implementation years, we illustrated our program by theoretical round faces sketched on each totem pole. The faces ranged from the top full-smiling ones to the flat-mouth faces and down to the full-frowning faces at the bottom. Twice, multiple talent totem poles with round faces have been a full feature in a publication. A first was in a June 1969 two-page article in *Pace* magazine on "Talents—Waving Good-bye to the Average Man." This excellent title also implies waving good-bye to the idea that there is a person who is on the top in everything, and good-bye to the out-dated notion that there is a person who is always on the bottom. The second publication, with a half-page full picture on the cover, was a 145 page *N*ational *I*nstitute of *E*ducation (NIE) publication of a national conference held here and titled, *Teaching for Talents and Gifts—1978 Status: Developing and Implementing Multiple Talent Teaching* (copies available in my office).

Beverly Lloyd distinguished herself by being the first to place the faces of live (instead of theoretical) students on the first six talent totem poles. Her two studies, first for a Masters project and the second for a doctoral dissertation, are reported below. In multiple talent classrooms, Beverly Lloyd was more than a teacher by becoming a teacher-observer and then beyond that into an observer-teacher through having a very high percentage of classroom time being spent by students as the active participants. She obtained totem-pole rankings by her direct observations of her students-in-action, in turn, in each talent. In her masters degree project, she taught and observed student performances in six talents. She used a double plus (+ +) on each talent for top performers and awarded 26 + +'s in her classroom for the total set of measures. As it turned out, 24 people received a single + + , one person received two + +'s, and the 26th person received no + +'s. A total of *96% of her students thereby earned at least one + + .* This was a fascinating study with remarkable results accomplished before she then did her talent totem pole dissertation described below.

In her doctoral dissertation, Beverly Lloyd (1984) had talent-trained her second-grade students throughout the year and was *the World-first* in placing all of them on the first six talent totem poles.

Across the years he has invariably been a most exciting and favorite teacher in the lengthy sessions he has covered in my workshops. He has also enabled students to photocopy, free, any and as many of his cards as they desired on a photocopy machine he had brought to class. Somehow in spite of his modest way, we have discovered that he has excelled in many other things such as being a superb Jazz pianist, an airplane pilot, etc.

She then followed up and studied these students through high school. She analyzed their high school transcripts and found that in obtaining their knowledge grades, they were largely functioning with only one talent, their academic talent, in high school classrooms (also showing the use of only a small amount of a second, weak talent).

The students however, were functioning with all 6 talents (that had been developed in their second grade) when they were fully engaged during high school in doing their own extracurricular activities. This observation argues that the successful cultivation of multiple talents in regular classrooms produces individuals who retain their full multi-talentedness which shows up much later in their participation in extracurricular high school activities.

Academic grades tend to be almost uncorrelated with extracurricular activities. Surprisingly, however, performances in extracurricular activities not only tend to bring out more whole-brainpower and whole-person performances but also have considerable success in predicting who will be the most effective in later careers. In striking contrast, traditional classroom activities have *little if any predictive validity* for later career and total life performances and accomplishments (Durbin, 1987).

Currently we illustrate our Multiple Talent Teaching by showing a first set of seven students on the nine Totem Pole Talents in Figure 1. These were live second grade students when their teacher, Beverly Lloyd, observed all 28 of them in 4 sets of 7 students functioning on the first six totem poles. Then she taught most of them again in the fifth grade and knew them well enough to place them on the last three new talents when these talents were later added to the totem poles.

We first rearranged some of the first six totem poles at the left. Then with invaluable help from Beverly Lloyd[2] and Sara Waldrop

2. In addition, Beverly pioneered in the starting of three of the five major programs cited in the Congressional Record (10/11/80, pp. S12407-11). She was the primary one who took the first workshop in Jordan District. She then helped set the stage so that the Bella Vista principal held the second workshop there which led to Project Implode, the first major program of this type in the world.

After my first three contacts, she was the main one of the next three persons who visited Mobile, Alabama so that soon thereafter, the *Talents Unlimited Project* was initiated. (While there she met Carol Schlichter before I did.)

She first presented the picture of the totem pole kids when we spoke in Minneapolis to a huge audience of school building professional types. This led to her receiving invitations to return yearly, including meeting people of the New Brighton School District. Then she, with JoAnn Seghini, helped to write the proposal, leading to *Project Reach*, with Harry Branes and Joyce Juntune as the initial directors.

these three new talent totem poles were created and all three were added at the right end, namely: Implementing, Human Relations, and Discerning Opportunities, making a current total of nine talents.
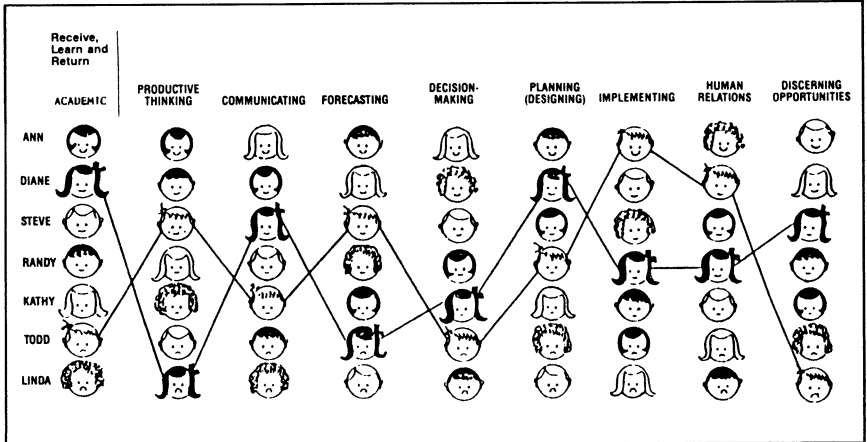
FIGURE 1. MULTIPLE TALENTS YIELD HIGH CREATIVE EXCELLENCE WHEN ALL COLLECTIVELY FUNCTION EFFECTIVELY

Taylor's Talent Totem Poles — 1984 Extended Version. Copyright © 1984, Calvin W. Taylor

The multiple talent totem poles show that no one is found at the top, or at the bottom, or in the middle across the nine different talents. Instead, everyone has strengths and weaknesses. The greater the number of different brainpower talents that all students learn to use, the more ''equal'' the students' scores will average across the nine talents. This averaging moves much closer to ''egalitarianism,'' but great individual differences still remain in each separate talent across the total profiles. Finally, almost all students are potentially high in at least one of an abundant variety of important talent resources, either within or beyond the first nine talents above.

In my classes of 25 students, by the end of the quarter the class members become well acquainted with each other and know their names and many of their talents and other characteristics. They all learn to function more as whole persons in class. As a by-product of the class, good human relations are being cultivated throughout the quarter. The last day I have had each of my students nominate from their fellow students the two who were best on the first talent, then

separately the two best on the second talent, and so on through seven talents. Across 16 undergraduate classes totaling about 400 students, I have had *99% be nominated as one of the top two* (top 8%) *in at least one or more talents* by some fellow students. And peer ratings or peer nominations of this type are the most effective source for obtaining data-and-scores which will best predict future performances. Probably, the students in my classes have been the only ones who have beaten Beverly Lloyd in this percentage.

My students are asked by me about comparing what happens in other classes vs. in my class during their *outside-of-class-time* for the entire quarter. They say that in other classes the teacher gets what the students call their assigned *chore* time, but I get their thinking and their observing time, which usually exceeds their chore time. When the quarter is over, they close their books and their notebooks and never see them ever again for their other classes, but thereafter I continue to get their thinking and their observing time. To friends and to others, they talk about their experiences in my class. They also stop and talk with my class members whenever they see them on campus, but they hardly know or speak this way on campus with members of their other classes.

We have just now reached a fourth way of extending our talents, from the 9 above to a new total of 17. The last 8 talents (all but the academic talent) are all very actively-functioning, high-level brainpower talents. As used herein, the academic talent is a learner-returner that only functions very *traditionally*. Whenever a person functions *creatively*, he or she has moved away from the traditional academic talent into one or more of the other 8 more active totem talents. Along with the academic talent, however, these other eight talents can *function traditionally* within typical traditional patterns. These other 8 talents can *function creatively* by breaking away from and going beyond the traditional patterns and the traditional styles of functioning into producing creative patterns and creative functioning styles.

For example, planning talents can function effectively within traditional patterns and can also function beyond those by producing new, original creative patterns. This means that there are two planning talents that function differently, namely planning traditionally vs. planning creatively. Likewise, for implementing traditionally vs. implementing creatively, etc.

With academic talent being a learner-returner talent, this makes a total of 17 different talents, 9 being *Talents Functioning Tradition-*

ally plus the last 8 being *Talents Functioning Creatively*—the highest goal of talent teaching.

The versatility and effectiveness of students can increase considerably by developing both ways of having their talents functioning—and also in recognizing in which of these two ways others are functioning. They can thereby increase their repertoire of important talent-functioning resources. The students can also be practiced and taught to discern when another person or groups of persons are reacting negatively to thinking-and-functioning of the creative type but will *not* be reacting negatively to thinking-and-functioning of a traditional-patterned type. This could enable some potential juvenile and adult delinquents to become cautious-and-wise in "reading and testing the situation" before using their readily available creativity. They could then try to *"keep their creativity on hold"* until they have found an audience that will tolerate and not be strongly hostile to such creative thoughts and creative ways of functioning. This could be important experiential training for some potentially highly creative persons. It is also a tremendous frontiering challenge for education—especially for those teachers who can learn how to be successful in effecting such preventative and even remedial training in the highly creatives.

Testing for Talents in Creativity, Leadership, and The Arts

We have initiated a new approach, starting at the grass roots level, by *testing for talents*. The purpose is to quickly create an awareness of the talent potentials of students in a very economical one-hour testing program. From the computer we next obtain the four talent scores of broad, high-level types. With the test scores we are then able to demonstrate the same types of things we have found in our earlier studies from classroom teaching data—which cost much more and take much longer, even months to obtain.

At the grass roots, we typically contact the citizens, primarily the elected members of the local districts' School Board. If they are interested, we propose having a class of students as a sample to be tested by our Form U Biographical Inventory. This will yield the following *four test scores* of high-level and high-value talents: (1) *Academic*, (2) *Creativity*, (3) *Leadership*, and (4) *The Arts*.

After the test has been taken, a second hour should be spent another day by having the students look at the test booklet items and discuss them with each other. Then they finally discuss the items with their teacher, so the teachers can learn from the students' comments.

Later, after the test scores become available, the scores are transformed and recorded on a *positive-only feedback form* which reports to each student what his or her two best talent potentials are out of the four. Ideally, this same feedback form of positive information is also made available to each student's parents.

This sets the stage so that the teacher has the great opportunity to discern that the class is full of high potential talent resources, with each student having a particular pattern of talent strengths. Also at this stage, the school has obtained a *Talent Bank of known talent potentials* for that class. Business and industry can go to their school looking for future employees of known high-level talent potentials. Practically nothing quite like this Talent Bank yet exists in any other class or school in their area (or state or nation).

If the teacher of that class wants to teach-for-talents, this can somehow be managed to occur. Then these students can be talent taught by a teacher using "asset-focused type of teaching." That teacher's class has then produced a second type, a higher type of *Talent Bank of known-and-developed talent potentials* that have been activated and are functioning in those students. Then business and industry can seek out and find talented-and-trained students whom they can later recruit and then utilize in their organization. Also this teacher can continue to take steps toward becoming a *Nationally Certified Talents Unlimited Teacher and Teacher-Trainer.*

A table used in earlier projects on data from the classroom teaching approach works exactly the same for the test score approach. Assuming complete independence of each of the scores, the following test score table emerges:

Number of Unrelated Talents	Percent of Students Above Average in at Least One Talent
4	93.8%
3	87.5%
2	75.0%
1	50.0%

In this theoretical treatment, as the chart continues upwards to more talents, the percent moves half way upwards to 100% in each case. However, the talent scores, in reality, approach but are not completely independent of each other. This produces some slippage in which the percent of students above average does not rise quite as

fast as in the theoretical table above. Practically speaking, it takes three scores to approach the 80% level and six or seven scores to approach 90%.

If we want to find at least above average promise in an increasing number of students, all we have to do is to keep increasing the number of sufficiently different talents that we use. This is true both in testing for talents and in teaching for talents. At the present time we are using four very broad types of talents in testing and nine less broad but still highly important talents in teaching students. We thereby capitalize on the great complexity of students to find real promise in practically everyone—quite quickly, especially through testing, but certainly also within a few months through teaching for talent assets.

Assume that we make the four Form U scores into a set of four talent totem poles, with seven persons on each pole. One person's highest score is at the top of the Academic pole and lower on the other three poles. Another person is at the top of the second pole of Creativity and can be given special training on that talent. The same can be done with the third person who is at the top of the Leadership pole and with the fourth person who is at the top of the fourth pole in The Arts. They can be given schooling opportunities in their area of greatest potential. Each of the other three persons has one, two, or three talents in which they are above average.

One generalized solution is to develop the talents of Creativity, Leadership, and the Arts in all seven of the students. The first student who excelled in only the Academic talent, which is the least related to career and life activities, probably *needs remedial training* in order *to save him* from being an Academic-type-only. Otherwise he might prove to be a *"lost person,"* unable to function very effectively beyond schooling, in careers and life.

Academic	Creativity	Leadership	The Arts
1	2	3	4
5	4	1	6
6	3	2	7
2	6	4	3
7	1	5	5
3	7	7	2
4	5	6	1
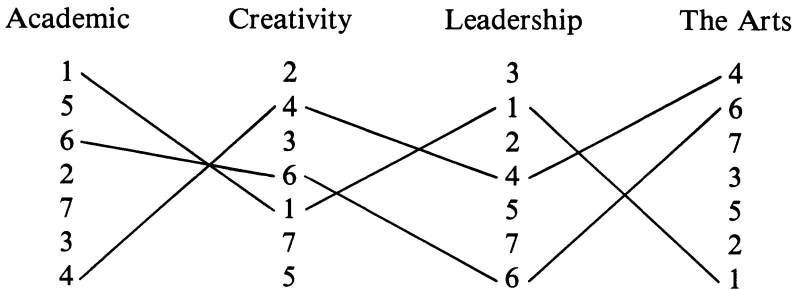
After drawing the three lines for three people, #1, #4, #6, across their profiles for four talents, I became aware that I had drawn a profile across numbers just like I would do on the chalkboard in a measurement or mathematics course. For the first time, I also realized that in so doing, I had replaced the people with their numbers and thereby *dehumanized* those people for the sake of "clear, compact, time-efficient teaching." Then, it became apparent that education, just like business, industry, and government have sometimes done, has also created some *dehumanizing of people*.

The thought that flashed then was that one of the great contributions of Darrel Allington and Beverly Lloyd was to prevent and correct the *dehumanizing* of people which occurs when I draw profiles across numbers on chalkboards. Darrel and Beverly had wisely used faces to replace a point, or a number, for a student on each test dimension. That *rehumanizing* was done initially by using theoretical faces and later by using real faces of real students on all the totem poles featured since then. Many people have remembered the little faces going up and down and have realized that this illustration of faces represents real students, not just geometrical representations of scores.

A brief study done earlier provides background for us before reporting a study we have just completed. The first Director of Research at the National Merit Scholarship Corporation was John Holland, my teammate in educational research articles and as a presenter at our 4th and 5th Utah Research Conferences on Creativity. The two of us, with Dr. Albo of our Department of Surgery and Pro Super-Scout Gil Brandt, later made a panel presentation about high-level talents needed in different professions (published in *Gifted Child Quarterly*, 1985).

Holland told me early and again recently about some Creative National Merit Scholarships they awarded when a donor submitted funds for only one year for that purpose. After all the regular Awardees had been selected, he then personally pulled out the complete stack of the finalists-but-not-awarded (2nd team) group of application folders. He skimmed through all of them in about one day and set aside each one which showed any positive clues about creativity. From this much smaller stack, he finally selected the required number, based upon the amount of creativity scholarship funds available. They were the "best of the lot in creativity" of the non-

traditional awardees and these 2nd teamers were then awarded Creativity National Merit Scholarships. He followed them up the next school year along with the regular 1st team National Merit Scholarship Awardees. Guess which of the two groups with equal financial support did better that next year? It was the 2nd team, the creative-and-academic group who had been selected on two different bases, rather that the 1st team, the group who had been selected essentially on only their academic talents.

Opportunities arise for me to do similar studies, after having been the main developer of the fellowship forms and selection procedures for the National Science Foundation Fellowship Programs, while working for 2 years at the National Academy of Science. Like in the case above, we predict in a recent study that those selected on three different bases will function more effectively and produce greater accomplishments in their total careers and lives than will those selected on only one basis.

A White House program on Presidential Scholars is designed to honor the highly selected graduating seniors in a nation-wide high school program. The selection committee mainly looks at the academic accomplishments (even though they are also interested in other assets of candidates).

Final awardees were made available for us to test and determine their three scores on the Form U Biographical Inventory, namely, Academic, Creativity, and Leadership Talents (against high school norms). The ranges of the Percentile Rank scores on the sample tested were:

	Academic	*Creativity*	*Leadership*
Range of Percentile Ranks:	89 to 99	18 to 99	35 to 99

We then decided to examine what would happen if all the candidates were given this test upstream, before the final selection decisions were made. From the total sample tested, by first selecting the top half with the highest profile (the highest total of the three scores), we were able to compare their total scores with the total scores for the remaining bottom half.

This produced the following profiles of average scores and of ranges of scores for the High and Low groups shown below. For the High group, please note how the bottom of the ranges have all raised

considerably upwards and how their *average* Percentile Rank scores have increased upwards into the 90's on both Creativity and Leadership and to the ceiling of 99 for their Academic scores.

	Academic	*Creativity*	*Leadership*
High Group Average	99	94	98
High Group Range	94 to 99	80 to 99	85 to 99
Low Group Average	98	78	79
Low Group Range	89 to 99	18 to 99	35 to 99

This program, with its large number of nation-wide candidates, could therefore select all of their final awardees so the bottom of their ranges would be in the mid 80's or above on all three scores and so the average Percentile Rank scores could all be around or above the mid 90's. Each Presidential Scholar awardee could be a truly high-level, three-talented person. This set of three high scores would provide increased predictive power and more assurance that the highly selected group of Presidential Scholar awardees will more likely *make future contributions* to society — as well as having been outstanding in their earlier schooling.

Some colleges and universities are moving in the opposite direction of narrowing the entrance requirements almost totally to the academic talents (see "Don't Dwarf our Brains: Thinking Students' Lament, Taylor, 1989.) This might be described as selecting the students who will best fit the strongly established knowledge-schooling-pattern rather than creating the ideal personal selection system *designed to select the best possible people* for total careers and life (not merely the best within the present educational system). It has been said, maybe as a rumor, that it took Einstein a couple of years to recover from the effects of the nature of graduate schooling on him. Perhaps such graduate schooling was not well-designed, but was ill-designed for an Einstein mind.

The effects of this narrowed-mind selection can show up at least in the vital research-focused parts of graduate programs. People are supposed to change almost immediately and become researchers and producers of future knowledge. *This great but unlikely change is assumed to occur* even though students have been rewarded and selected for years for viewing the past knowledge with great "awe" and thereby being the most efficient learner-returners of it. Suddenly they face a nearly 180 degree different type of opportunity (which

goes against the grain of their lifelong educational programming) by challenging the past knowledge in order to reform it or by going beyond it.

The research part of graduate school can also be very painful in many ways to these selected types of grade-getting students. Perhaps research goes too much against the graining of nearly all their training. In a large number of doctoral research programs, even the majority of "successful doctorates" never do research again after all that expensive graduate research work. It can be said that they *never manage* to do research again — or stated more strongly, they *manage never* to do research again (see the reference to the first invited outsider ever to speak on creativity to all Graduate Deans in their annual convention in our nation, Taylor, *1978*).

This is in contrast to a graduate student who after spending only a first week in my research activities, openly volunteered "Why did I have to wait so long? Why wasn't all my schooling like this?" He has spent all his career very successfully as a full time researcher. He also proved to be an excellent research-designer proposal writer, even for the Ph.Ds in his Research Center who could not write good proposals.

Students in Japan say that *their life in the current schooling is very unnatural for them.* To try to compete, in order to equal or beat Japan in knowledge-focused education, means that our students would have an ill-designed or even a distorted kind of illness-growth-and-development of their inner human resources during their schooling processes. Instead, we should have schooling well-designed for every student's mind to strengthen their wellness and increase their lifelong effectiveness.

Another type of use of our early testing of people has been to look for profile patterns of certain types. Fortunately we had the opportunity to test a sizable group of people described by us as being *Adult Delinquents.* Their average Percentile Rank pattern has caught a lot of attention and provoked considerable discussion. *They might have become great improvement agents* in societies and have been assets rather than liabilities if their creativeness had been *supported* positively into constructive creativity rather than *thwarted* and *distorted* negatively into destructive creativity. Their Percentile Rank scores (including Educational Orientation showing how far they intended to go through school) are presented to stimulate the thinking of readers.

Creativity	Leadership	Arts	Academic	Educational Orientation
63	44	48	34	18

We have been able to derive composite scores on Creative Talents and on Leadership Talents from the 9 classroom teaching totem poles. First, we retained the classroom Academic totem pole below on the left. Then we applied appropriate differential weights to each of the other classroom totem poles to obtain Creativity Composite and Leadership Composite scores. In this way we derive a profile of three scores from classroom data comparable to the first three main talent scores obtained on the Form U Biographical Inventory. These yield the following profiles:

Academic	Creativity	Leadership
Ann	Kathy	Randy
Diane	Randy	Ann
Steve	Ann	Todd
Randy	Todd	Kathy
Kathy	Steve	Diane
Todd	Linda	Linda
Linda	Diane	Steve
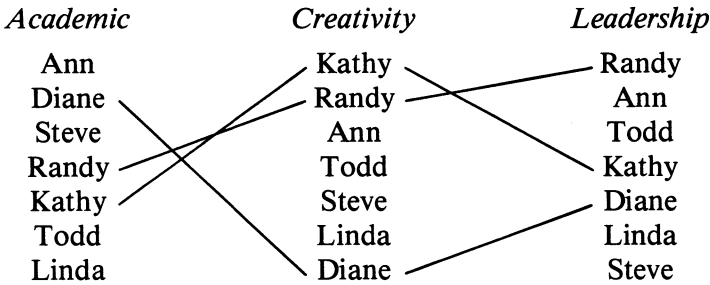
Treat Students as Thinkers, not Merely Learner-Returners

A quarter of a century ago, a first dissertation of its type by Hutchinson (1963) was focused initially in Phase I upon four typical classrooms of students in which four separate teachers treated students as *Learners (learner-returners of knowledge)*. Then in Phase II four other parallel classrooms were taught by the same four teachers so that the students were treated as *Thinkers (about knowledge)* in the same knowledge curriculum.

In comparison with the traditional classroom of knowledge-learner-returners, there was no loss in knowledge test scores by having students learn how to use their thinking brains in working with the knowledge. However, there were great gains in having students learn valuable ways in which their brains can think during these knowledge acquiring sessions. That is, there were great gains in activating and developing their thinking talents into becoming actualized

resources, not just potential resources. This thinking talent gain was an increase over using traditional lower-level, learner-returner processes in which all thinking talents are almost eliminated in learning knowledge. Dr. Guilford wrote a personal letter congratulating Hutchinson on his excellent (worldwide) pioneering research work on learning vs. thinking classrooms.

The outcome was sufficiently positive a quarter of a century ago that education could have realized, both then and since, that simply, definitely, and quickly, the educational system can be improved by having teachers *treat students as thinkers, not merely knowledge-learner-returners*. (In education, whenever anyone uses "learn" or "learning" alone, it is practically certain that they are referring to learning *knowledge*—not *talents*.) Teachers can learn to treat students as thinkers with comparatively little training—and with helpful manuals.

This approach could be restated as having teachers learn how to *treat students as having brains that can think and that can be used as a better way to acquire and retain knowledge*. This is much better than treating students as having only a tape recorder-type of a low-level *skill* (but not by using any high-level brainpower thinking *talents*) for merely learning-and-returning knowledge on a test—and then gradually and continually forgetting most of it.

I purchased a picture of *an outwardly active thinker* which could be used to illustrate creative persons probing into their external world. It contrasts with Rodin's statue which displays an inwardly reflecting, contemplating thinker. It seems that both reflecting and inquiring persons should be looking backwards into the past with *yesterday minds* and be searching forwards into the future with *tomorrow minds*.

We finally decided to use the picture for which we had a negative most readily available, so we produced back-to-back pictures of the outwardly probing thinkers. To do so we had to flip the negative over to get the second probing thinker. We thereby changed him from a backward-probing northpaw to a forward-probing southpaw. Afterwards we realized that we had surprised ourselves by changing the pictured person from one side of his brain to the other—from the *left-side*, logical-brain person looking backwards to the *right-side*, creative-brain person probing forwards. From this picture, the reader can also visualize back-to-back, reverse statues of Rodin's reflective, contemplative thinker.
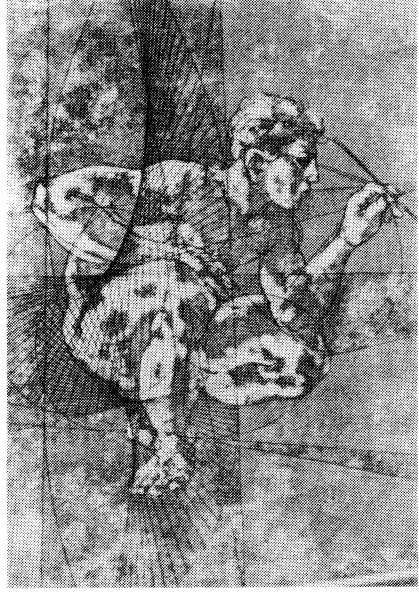
A sensitive and astute new colleague recently educated me to improve my expressions by saying "Learn to treat students to use both *their heart* and *their brain* as an even better way to gain and retain knowledge." One poet, as I recall, said that what the heart learns today, the head will learn tomorrow. The reverse of that statement, *"what the brain learns today"* raises the question of *whether the heart will learn it* — or even learn some of it — tomorrow, or ever?

Moving   Toward   Equalizing   Simultaneous   KOBE's   and TOBE's

In the 1984-5 school year, Utah had two large conferences on an educational approach called *O*utcome-*B*ased *E*ducation (OBE). Then in the 1985-6 school year the Utah Legislature and Governor approved the funding of the new OBE program. Very clearly, this program emphasized mastery of knowledge by all students as the highly-focused outcome in education. Consequently, this could be called *K*nowledge *O*utcome *B*ased *E*ducation (KOBE).

For a long while, our talent-focused approach has also been outcome-based (also called criterion based). Since development of talents is our main new outcome, in a parallel way this talent-

outcome-approach could be called *Talent Outcome Based Education* (TOBE).

Putting these together simultaneously, as we have always done, produces the combination of the TOBE and KOBE approach in education. In this way, there is no need to debate knowledge versus talents or learning knowledge versus learning to function effectively. In other words, both types of ignorance, i.e., Knowledge Ignorance and Talent Ignorance (ignorance of functioning effectively) will be overcome by a double focused curriculum on Knowledge and Talents.

Ultimately *the highest potential "people" curriculum needs to be seen as parallel* and *at least equal in importance to the current knowledge curriculum*. Then education will be functioning equally (1) for developing people and (2) for learning past knowledge resources (including the generating of future knowledge resources through the effectively functioning creative talents of people).

Schooling's outcomes can now be based on knowledge in combination with talents, i.e., on a whole set of KOBE-TOBE's. The interaction strengthens knowledge acquisition and lengthens the durability, transferability, and usability of both knowledge and talents. We can now combine these two outcomes to form the powerful and lasting KOBE-TOBE combinations.

Improving Education by Developing Whole Brains and Whole Persons

Our own basic research could be described as measurement research on important human characteristics. These massive efforts have involved the development of many *valid* human measures usually not psychometrically well-measured heretofore.

Education had not been widely aware that the vital topics of *Reliability* and *Validity* apply to schooling as well as to testing. Education is much too enamored and especially too hung-up on *Reliability* (precision in repeatability) and is far too little concerned about giving value to the *Transferability* (Taylor, 1978) of its schooling and to the *Validity* of being focused on a much more ultimate target. If education and its "reliable" measures of schooling or its transcripts cannot predict anything with noticeable validity beyond schooling into careers and life, *then it is very true that education is not in sound shape, but is extremely vulnerable.*

Though education can give the trivial argument that current schooling is "reliably reproducible" within itself, this does not guarantee that there is much transferability or predictability from educational schooling measures to functioning in activities beyond formal schooling years both in careers and in life. By these misconceptions and "fixed ideas" of emphasizing reliability and almost utterly disregarding transfer of training and predictive validity, *education has sadly handicapped and restricted itself from making any truly major reforms in its systems.*

The way toward major improvement in education is opened by the fundamental measurement research, measurement theory, and implementation-into-practice of Thurstone in *The Vectors of Mind* (1935, 1947) and of Guilford in his book *Way Beyond the IQ* (1977). Collectively their works expand the entire nature of the performances and the characteristics that should be and can now be developed and measured in the schooling of students. In combination, their research studies have discovered over 100 specific high-level brainpower talents available for cultivation. These specific talents could also be implemented into education. They are at a less complex level than the totem pole talents which in turn are sub-components of the four Form U highest-level tested talents.

These scientifically measured discoveries certainly illustrate that: *There is nothing more complex and more High-Tech than the brain. There is also nothing more challenging and more promising for educational improvements than activating and cultivating the full brain and its hidden talent-and-energy resources — both in its internal structuring-and-processing and in its external potentialities.*

This all adds up to the policy that the development of the great economic resources of thinking, producing, and creating brainpower talents should have higher priority in education and in society than the knowledge resources or the capital resources or the natural resources. The knowledge resources and the capital resources are both inert — they have no energy or life whatsoever of their own or on their own. They will just sit there forever unless a human being comes along and does something to them and with them. The natural resources become most valuable for humans when people, with their vast inner resources, team up with the natural resources to design better environments and better worlds for people.

We can now cultivate many talents and thus move toward a goal-fulfillment stage of activating and developing more of the total

potential resources in a person. The outcome could be more whole-hearted, more wholebrained, more effectively-functioning, multi-talented whole persons.

From our major studies of practicing physicians, we can picture an ideal physician-in-practice striving for *professional excellence* (Albo and Taylor, 1982). When you come to his office he works diligently and efficiently to take away your illnesses, but definitely *not* to take away your thinking powers *nor* to have you become only a listener. But he does want you to communicate with him about your symptoms and your hunches as to what is wrong. You don't have to stop thinking or stop having exchanges and discussions with him when you walk into his office. When your illnesses have been taken away, he will then work further to team with you to discuss unnecessary amounts of stress and to plan and take action in the feasible ways possible to increase and strengthen your total wellness.

Schooling could wisely follow a similar pattern. Come in and don't be afraid. We won't take away your mind or your confidence in yourself. We want to help you develop your mind naturally and fully, while, as a by-product, you are soundly increasing your self-esteem. You don't have to stop thinking or put your mind on 'hold' when you walk into our school. Come and join us in a greenhouse-like climate where natural growth in knowledge and in thinking exist together and function productively and where a cooperative spirit of friendliness, laughter, and wellness abide.

Nowadays in schooling, children can develop *toward the ideal goal of human excellence*. This is all in sharp contrast to having them become programmed to keep their mindpowers under tight disciplinary control—thereby directly minimizing and dwarfing their brain into an oversimplified memory-tape-recording-and-replaying system. It is much better if young people learn to use their total talent and energy-generating brain than to have most of it—and the most powerful parts of it—remain largely lost to them and to their society. For according to Sam Proctor, "a mind (or any important part of a mind) is a terrible thing to waste."

Most of our manuals have been one talent at a time across subject matter. We are very pleased when Jean Whaley of Lutz, Florida, wrote a first booklet on the topic of the American Family by using a warm-up exercise and then ten multi-talent (not single talent) activities. She used a number of talents per activity varying from two to seven of the nine talents across the ten activities. These multi-talent

activities are more lifelike than the single-talent activities, which we have used to train and launch teachers and students. Whaley, who attended our World Conference, has continued in the same way of creating multi-talented activities on other topics — and we are delighted with her work.

Our latest clear but troublesome thinking is that the development of the great brainpower resources is not and has practically never been anyone's or any organization's primary focus. Essentially it has been nobody's real business. It has practically fallen between the cracks of all major establishments. However, it could become almost anybody's and everybody's and any organization's important new business. We can conceive of the total brainpower resources as being *economic resources, community development resources, national development resources, and world development resources.* The brainpowers are also the greatest potential energy sources-and-resources, being more important than nuclear energy powers from fission and/or from fusion. And the discovery and harnessing of nature's energy resources have come about *only* through the talents-and-energies of the hearts-and-minds of creative people.

From a very sound research basis and from very positive findings on multiple implementation projects, the following results can be expected from using this multiple talent development approach in classrooms. Students become more resourceful after activating their own potential inner resources and developing them; thereby greater total classroom resources are available. Schooling doesn't cost any more once teachers can develop students' talents, but double the growth in students occurs — because growth occurs in both talents and knowledge. Other outcomes are: An unbroken string of positive research results against traditional comparison classrooms in ten independent projects scattered across the U.S.A.; a higher concept of student potentials held by teachers; more student and teacher satisfaction; increased self-esteem in both students and teachers; more individualizing of education; more teamwork among students; enhanced teaching and development of career and lifelong talents; and increased wellness and peace-of-mind from the well-designed.

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The Creative Scholars Mentors Program

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I profoundly appreciate this opportunity to address a few words to The World Council for Gifted and Talented Children about The Creative-Mentors Program. This Program is one of the most important activities of the Torrance Center for Creative Studies.

Society desperately needs many different kinds of giftedness and all of them should be honored and cultivated. Children demonstrating outstanding promise in all these areas of giftedness are society's greatest treasures. Long ago, I chose to be an advocate of the creatively gifted. In almost every field of human achievement, creativity is a distinguishing characteric of the truly eminent. The possession of high intelligence, special talent, and high technical skills is not enough to produce outstanding achievement. But the highly creative child has an awfully difficult time to survive as a creative person — all over the world.

The Torrance Center for Creative Studies thought it could best minister to these creative scholars of the world through the creative scholars-mentors network. We have given much thought to the kind of help they need most desperately, the kind of help they might give one another, and the kind of services we might provide.

We are already beginning to identify creative scholars and putting them in touch with one of the over 100 mentors we have secured—themselves creative scholars.

A Creative Relationship

I know that possibly the greatest service we could offer them is a creative relationship—a relationship in which one thing leads to another. Through this relationship we might help them to walk away from the "games" that others try to impose upon them and play their own games, using their best abilities, doing the things they love, pursuing their dreams.

A Mentor Relationship

Another service would be to help them find and establish relationships with a mentor. I don't think we fully understand what a powerful thing this can be. Through my 22-year longitudinal study of creative behavior, I (Torrance, 1981, 1984) have demonstrated statistically that having a mentor increases significantly chances of creative achievement.

Counseling Services

Certainly, on the University campus and in our special summer programs, we can offer them a counseling service. To provide this service would require a counselor who understands the creative person, the creative problem solving process, and the creative relationship.

Special Seminars and Curricula

In our seminars and short courses in summer programs, we would require a curriculum especially suited to the problems of the creative person. This would include:

1. How to use the Manifesto for Children (Torrance, 1983; Henderson, Presbury, and Torrance, 1983.

2. Skills of creative negotiating.

3. Skills of inventing and initiating—and the companion skills of selling or marketing.

4. How to deal with ridicule and other common problems of creative children and adults.

Parent Education Programs

Another service would be the parent education program. This would include seminars and short courses at the University and elsewhere, as well as a correspondence program. Occasionally I receive follow-up from parents of creative children with whom I have corresponded.

Network of Persons Skilled in Helping Creatives

Another important service that might be offered is access to a national or international network of people skilled in helping creative children and adults and who are willing to do so. I believe there is a need and plenty of people who would form such a network.

Other Creative Talent Networks

We are also looking forward to the opportunities of tapping into other creative talent networks, such as: PRIME Mentors of Canada for the Development of Creative Potential organized by Dr. Conchita Tan-Willman, Dr. Carolyn Falk's Falk Foundation in Connecticut, The Future Problem Solving Program headed by Dr. Anne Crabbe, The World Council's own network of gifted children, and others.

To Struggle for Creative Excellence: An Option for Gifted Children in Mexico

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Myths are the biggest barrier that prevents parents from reaching out and helping their children develop to full capacity. Parents and classroom teachers alike may even feel that it is wrong for their children to want to learn more than what is considered normal. We may even find teachers, counselors and psychologists blaming parents for their child's accelerated learning which then results in boredom and lack of motivation to accomplish school work.

The most common myth is that this accelerated learning is harmful to the child. The more he learns, the more marked are the differences between the child and his peers. We know the contrary is true. The more the hunger for learning is satisfied, the happier the child, and the more readily he will relate to his peers. Emphasis is incorrectly placed on the effect, that is, child peer relationship, and not the cause, or need for the gifted child to maintain an equally high level of self esteem as his peers.

This is the irony. Social development is stressed, academic accomplishments are held second in importance. These factors unite to influence the young adult when it is time to enter college. He may even reject the idea of entering college outright. At this point everybody is surprised. "What has happened to the once gifted child?", we ask. If he does enter college our young adult may drop out be-

cause he has not exercised his skills and capabilities and is unable to adapt.

In Mexico we find that the creatively gifted child is often seen as a problem child who must be frequently sent out of the classroom or even expelled from school. Teachers don't seem to care about their gifts. They go unnoticed. This behavior may be hidden or misinterpreted by their parents and teachers. Many are high achievers in one area and underachievers in others. Importance may wrongly be placed in rounding out the child's education by working harder on the weaker areas. The net result is usually that the child gets tired of working so hard on his areas of weakness that he has little energy left for study, even in his areas of greatest potential. In my opinion this is the way we turn off those special talents and make the child feel that he is inadequate.

Psychology has become a big business in Mexico. Counseling of children with small problems detected by teachers is frequently turned over to a psychiatrist or psychologist. In this way the teacher is set free of any responsibility for the emotional development of the child.

In Spanish the word used to describe the gifted child is "Superdotado" which when translated means "supergifted". Therefore "Superdotado" may elicit sarcastic laughter among the people who believe in the myth that gifted children or adults do not commonly exist.

Many teachers believe that directing gifted children into special programs is a risky business. The real goal is to make all children conform to the norm. They also believe that by enriching the curriculum of a minority of children they will accentuate the differences between the groups.

In the environment I have described, we see that advanced study and accelerated learning is actually considered wrong. Emphasis is placed on high grades which is after all only a measure of memorization skills in some of the subjects studied, without consideration for the complexity or content of the curriculum. This curriculum is geared towards conformity to the norm and not the development of the individual capacities of the children.

Educating the public to look at the bright (right) side of this creative potential is a tremendous job. These gifted children must be cuddled, cradled and led to produce.

These are some of the reasons for my having created the Children's University or ("Universidad de Los Ninos," in Spanish). Its

name implies a school for children at advanced study levels. It started out as a special help for gifted students who were misunderstood in the regular school environment. We offer many subjects that take the form of workshops, study groups and labs. It is like a small university, but for children. They can study subjects or courses that are not offered elsewhere. It's offered for elementary and pre-school children.

At the "Universidad de Los Ninos" we create a course of study at a level which will challenge the children's capacity and develop it. The result of creating this atmosphere is that the child feels comfortable to the point of expressing his creativity freely by getting rid of his inhibitions created by the regular school environment.

At the "Universidad de Los Ninos" we also focus on emotions, attitudes and values. We help the child develop a positive self concept, awareness of his personal likes and dislikes. Awareness of himself and what it means to be gifted. We build on his communication and socialization skills. We give him the tools to help him solve problems creatively and we try to provide valuable experiences that the children will be able to use elsewhere. This becomes a very important part of our approach to teaching, just as valuable as the academic skills.

Because there is no grade given, the child gets the feeling that learning can be fun. The child doesn't get homework or exams, which create unnecessary pressure. The goals are set high and each child pursues them trying to do his best in class.

The students at the "Universidad de Los Ninos" are carefully selected by several factors: Motivation, creativity, behavioral characteristics, interests in personal specific areas, and a standardized I.Q. test. Surveys are yearly presented to all students at the "Universidad de Los Ninos". We keep files of each of the student's hobbies and interests. The children are separated by ability and interest, not strictly by age. The division within the school is basically beginners, intermediate and advanced.

We agree with what Calvin Taylor says "The children are able to function well in these adult-like activities." At the "Universidad de Los Ninos" they sometimes seem like small adults, and learn by themselves.

All the courses have integrated into them field trips, hands on experience with instruments of measurement and observation. Every class includes a different experiment.

We are also constantly growing and changing our attitudes towards the children as we learn from them about the changing needs

and desires of their inquiring minds. This prevents our program from ever being static or fixed. If we can satisfy their love and need to learn, we know that the children will grow up prepared to enter our competitive world with confidence and self-esteem which will benefit them and all who are privileged to be a part of their lives.

Editor's Comments: With her help and help from Utah the Form U Biographical Inventory was translated (and translated back as a check). She was the first to use this Spanish version on 14 of the students in her private school. The results were very heartening to anyone interested in discovering the potentials of students in Spanish speaking countries. On the four talent scores of Academic, Creativity, the Arts, and Leadership, 11 of the 14 students had at least one percentile rank score essentially in the 90's. 36% were above average in all four scores and 79% were above average in two or more of the four scores. One student was in the 90th percentile on two talents with 11 and 17 scores on the other two. Her results suggest that any school, state, or nation could do a national search and find a great variety of talent profiles across the students. In addition high promise in one or more of these talents can be discovered in a large majority of all students most of whom can finish the biographical inventory in one hour's testing time.

Developing the Creative Potential of Pupils of All Abilities in a Non-racial South African Primary School

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When labels such as "the gifted child" or "the dyslexic child" enter educational terminology, two important issues must be faced: one is the question of definition and the other is what special provision one is going to make for those who fit the definition. Experience has shown that to give a child any label can lead to more problems than solutions. This is certainly true in the area of the gifted and talented. Children burdened with the label of "gifted" are faced with a variety of pressures from home and school and, when they do not live up to expectations, they usually have to cope with an unreasonable sense of failure. This problem has been aggravated by thinking of academic excellence and high I.Q. as the main indicators of giftedness, while at the same time defining giftedness in broad, all-inclusive terms.

This has meant that in making provision for gifted children the normal practice has been to withdraw them from the regular classroom and cater for them as a separate group. In America, William Bennett, Secretary for Education, noted the following in a report called "First lessons" (p.61):

> Too often today, the education of gifted children is fragmented in the same ways as is special education — administered in pull-out classes that provide enrichment in specialized settings.

In addition to this problem of fragmentation, Diane Ravitch, in the same report, said (p. 61):

> What we now teach *some* children in "gifted and talented" programmes was once part of the standard curriculum for average children in ordinary classes.

This drop in the educational standards in American schools has led researchers to believe that it is necessary to solve the current problems associated with the education of all children, and that this will then provide the best foundation for educating those who are specially talented and gifted.

In this regard, some recent research, documented in a book called *Developing Talent in Young People* by Benjamin Bloom, draws some important conclusions:

1. After forty years of intensive research on school learning in the United States as well as abroad, my major conclusion is: What any person in the world can learn, almost all persons can learn if provided with *appropriate prior and current conditions of learning* (my emphasis)

2. The middle 95% of school students become very similar in terms of their measured achievement, learning ability, rate of learning, and motivation for further learning when provided with *favorable learning conditions.* (my emphasis)

What is more, Bloom says, ". . . we believe that only a small percentage (10% or less) of talented individuals have progressed far enough by age 11 or 12 for anyone to make confident predictions that these (children) would be among the top 25 in (their particular) talent field by the ages of 20 to 30." We should be very wary, therefore, of using the word "gifted" in relation to pupil potential. It should rather be used to describe actual achievement, especially in the sense of someone who has made a unique or an outstanding contribution to society.

In formulating a policy for gifted education, it seems that a school must start from the premise that all children are gifted and that the school, together with the home, must aim at providing "favorable learning conditions" to give each child the best possible opportunity to discover and develop his own unique talents. This is the environment St. Andrew's Prep. School is striving to create, one which is unpressurized, family- rather than produce-oriented so that pupils of all abilities and all race groups can learn to develop them-

selves in harmony with the needs and values of other people different than themselves.

The school's theoretical base originates from Dr. Joseph Renzulli's "Three Rings" definition of gifted behavior, which states that when intelligence, task commitment and creativity occur at the same time, we have the makings of gifted behavior. All people are capable of demonstrating gifted behavior at different times and in different activities, so the goal of education should be to encourage children to function in this manner as frequently as possible. What this means in practice is that the school tries to operate all its activities according to Renzulli's Enrichment Triad, which is a description of three types of enrichment behavior.

Type A: All pupils are exposed to as wide a range of experiences or fields of study as possible to broaden and stimulate their interests.

Type B: All pupils are taught specific thinking, learning, problem-solving and communication skills within the context of Type A activities.

Type C: Pupils undertake investigative activities and artistic productions in which the learner assumes the role of a first-hand inquirer, thinking, feeling and acting like a practicing professional. These activities would be only for pupils who demonstrate sincere interest in particular topics or problems and also who demonstrate sincere interest in particular topics or problems and also show a willingness to pursue these topics at advanced levels of involvement.

What one is aiming at is achieving a constant flow of pupils from one type of behavior to another with Type A and Type B activities providing pupils with enrichment experiences, whereas Type C activities extend different groups of children in as many different activities as possible.

Side by side with the flexibility of the Enrichment Triad model, St. Andrew's Prep's educational program also takes into account the natural stages of development through which all children pass. An essential guide in this regard is a Taxonomy of Knowledge such as that of Benjamin Bloom.

It is important for children to be ranging constantly through the different levels of knowledge so as to develop higher order thinking skills and to become proficient at all levels. Maslow's Theory of

Human Needs also provides the basic needs of a child, the self-actualization process will be hindered. Recent research on the brain dominance and individual learning styles has indicated that the integration of the four brain functions of thinking, feeling, sensing and intuition in the learning program leads to higher levels of intelligence and optimum development of human potential.

These, then are the major theoretical structures upon which St. Andrew's Prep. formulates its educational activities. Central to it, is the acceptance that giftedness is a variable present in all people, so it must be nurtured in everyone. As it usually manifests itself in a specific area, and not necessarily the narrow academic one, pupils are exposed to a wide range of experiences and activities both inside and outside the regular curriculum. The school then provides the instructional methods and materials to promote the thinking, decision-making, sensing and feeling processes. The more thoroughly this can be done, the more likelihood there is of the children's discovering and developing their innate abilities and interests and eventually exhibiting gifted behavior.

On a practical level, this means educating the total personality, i.e., giving attention to each of the following standards (std):

1. Intellectual
2. Physical
3. Social
4. Moral
5. Emotional
6. Intuitive

St. Andrew's Prep. has chosen the following nine major areas in which to foster gifted behavior by creating the "favorable learning conditions" referred to by Bloom:

1. Academic Program
2. Guidance and Counseling
3. Assessment
4. Leadership Training
5. Music, Art and Drama
6. Outdoor Education
7. Clubs and Hobbies
8. Sport
9. Community Service

The following are examples of some of the programs which have been implemented to foster gifted education:

A. Across the Standards Grouping

The program offers pupils of different age groups the opportunity to work together in specific interest groups. The options available to the pupils are grouped according to three levels: *Level I*

Level I	*Level II*	*Level III*
1 Choir	1 Science	1 Turbo-Maths
2 Art	2 English	-English
3 Drama		-Afrikaans
4 Problem-Solving		

To participate in a Level I activity—Choir, Art, Drama or Problem-Solving—pupils must demonstrate superior ability, a genuine interest in the subject and a high level of task commitment. Level II activities are for pupils with a genuine interest in the subjects but who do not necessarily demonstrate superior ability or high task commitment. The Turbo groups in Level III are for pupils who require extra assistance to master the basic skills in Mathematics, English and Afrikaans. As far as possible, pupils are able to choose their groups, which then meet for an hour every week.

B. Guidance and Counseling

If a school claims to cater for the individual needs of its pupils — and those with special talents and abilities usually need more help than others — a comprehensive guidance and counseling program is essential, especially one in which all members of staff assume the role of counselors. The more channels of communication in a school between pupils and adults, the more chance there is of pupils' problems being resolved as quickly and as efficiently as possible. The formal Guidance program, conducted by class teachers during two lessons each week, is evolving to include the following points:
—includes all pupils
—is individualized
—emphasizes the positive
—promotes growth and change
—involves decision-making
—promotes assertive behavior
—is a team effort
—provided in multiple settings

Among the best Guidance programs developed so far are the "Game of Life" for Std 4, whereby pupils are involved in real-life decisions related to owning property, buying a house, taking out insurance, buying food, and so on; the Decision-Making program for Std 5 and the Std 6 program which prepares pupils for the transition from primary school to senior school.

C. Assessment

So many assessment programs in schools do not give pupils the opportunity to assess themselves, which then creates the impression that the assessment is something which always comes from an external source. Self-assessment by pupils is also important for teachers, as it provides them with a valuable insight into how the pupils perceive their own efforts and performance. The following is the assessment form used by both pupils and teachers at St. Andrew's Prep. for pupils in Standard 6.

At each assessment date the form is completed by the pupils and their teachers. Copies are photostated and exchanged, after which the pupils discuss their assessments individually with their class teacher. If there are any discrepancies between the pupil's assessment and that of his teacher, the reasons are discussed and dialogue established between the pupil and the particular teacher. This method encourages pupils to be self-motivated and assertive in resolving their problems.

Developing the creative potential of pupils is a dynamic process, one which is in a constant state of growth, as changes must regularly take place to maintain and extend the "favorable learning conditions" which are a prerequisite for meeting the needs of all children. New programs must be introduced and old ones revitalized or dropped when they are no longer functioning effectively. At St. Andrew's Prep. the adoption of a modified form of the Renzulli model has provided the school with a sound theoretical framework to implement these changes. The results have already been dramatic and the school now caters far more effectively than ever before for the needs of all its pupils.

A Theoretical Model of
Creative Potential in Young Children

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Within the framework of studying creativity as original problem-solving, researchers and theorists (Treffinger, Isaksen, & Firestien, 1982) have specified a process which involves the definition of the problem, the generation of ideas and solutions, the evaluation of those solutions, and the execution or conversion of ideas into products. Identification of the proper criterion measures for creativity, however, has been a highly debated issue. The construct validity of the ideational fluency measures used to assess creativity has been criticized. Therefore, researchers have attempted to move closer to the examination of real-world creativity by using self-report inventories of hobbies or extracurricular activities (Milgram and Milgram, 1976), and/or stringent solution-standard laboratory tasks (Milgram & Arad, 1981) as criterion measures for the lenient solution-standard predictor measures.

At the preschool level, both the Treffinger framework (Treffinger et al. 1982) and the attempt to approximate real world creativ-

ity through self-reports or stringent-solution tasks must be questioned. Ward (1974) recommended that researchers abandon the notion of predicting adult accomplishment and accept what we can measure in young children as creativity. Researchers have indicated that preschool children have developmentally limited abilities for hypothesis testing, evaluation, and use of cognitive mediation. This is clearly evidenced in children's learning literature (Stevenson, 1970) using studies on reversal shifts (Kendler & Kendler, 1959), on transposition (Kuenne, 1946), and on probability learning (Weir, 1964). These researchers demonstrated the distinct differences in cognitive capabilities between preschoolers and older children, yet few models of creativity appear to inadequately deal with this developmental issue. Although some researchers had argued (e.g., Moran, Sawyers, Fu, & Milgram, in press; Starkweather, 1964) that the same criterion cannot be applied to both young children and adults, a clear distinction between the creative potential of the preschooler and the creative behavior of the adult was not made explicit. We suggest that, given the level of evaluation abilities in young children, the focus of creativity or original problem-solving research at this younger age should focus on the generation of ideas — the process that precedes evaluation.

Thus, we as define creativity as "the interpersonal and intrapersonal process by means of which *original, high quality*, and *genuinely significant* products are developed", a developmental progression is evidenced. For young children, the criterion is *originality*, for older children the component of *quality* (based on self-evaluation) is added, and for adults the criterion also includes *significance* (based on cultural evaluation). This progression is demonstrated in Figure 1. Thus, rather than ideational fluency serving as a predictor (as typically conceived by most researchers), it operates as a criterion measure for the *potential* for creative behavior in young children.

In older children and adults, ideational fluency operates more as a direct predictor of creative behavior. Such a conceptualization, indicates that the variety of factors related to the creative process will vary in influence as a function of age or context. That is, each of the major steps identified by Treffinger et al (1982) are influenced by a variety of factors, including contextual (e.g., curriculum), cognitive (e.g., curiosity), and personality (e.g., conformity) variables affecting the outcomes. Moreover, the relationship among and inclusive of specific variables will change with each stage of development. These relationships for the young child are detailed in Figure 2.

DEFINITION	PROCESS	CRITERION	AGE
ORIGINAL (i.e., unusual)	Ideational Fluency	Creative Potential	Pre-school
and			
HIGH QUALITY (i.e., workable)	Original Solutions	Creative Precurors	School Age
and			
GENUINELY SIGNIFICANT (i.e., contributes to society)	Execution of Original Products	Creative Behavior	Adult

FIGURE 1: DEVELOPMENTAL PROGRESSION OF CREATIVITY
"Creativity is the intrapersonal and interpersonal process by means of which original, high quality, and genuinely significant products are developed."

This model is conceived within an ecological (Bronfenbrenner (1979) framework and allows for the determination of direct and indirect effects of multiple variables as well as the relative weights of these effects via regression and path analyses. Bronfenbrenner's (1979) description of microsystems, mesosystems, and macrosystems, we believe are quite applicable and are entered into the model as contextual and cultural variables. It should be noted, however, that although we recognize the bidirectionality and interrelationships of all these factors, for the purpose of simplification of the pictorial representation, Figure 2 depicts only the uniderectional effects influencing the generation of original responses. We postulate that these relationships are dynamic and largely directed through contextual variables. Thus, in any particular context, the personality or cognitive or cultural or biological variables may be expressed in a different fashion depending on the context.

We suggest that the relationships identified for preschool children will undoubtedly change with age and the development of these char-

acteristics. The model itself is dynamic, in that variables will be added or deleted as research data is accumulated. It clearly provides a system appropriate for hypotheses-generation and verification. Future work should be directed at expanding our understanding of the applicability of comprehensive theoretical frameworks for creativity at several stages of development.

CULTURAL
- experience
- expectations
- lifestyles

BIOLOGICAL
- gender
- brain function
- perception

CONTEXTUAL
- play opportunityes
- teacher behavior
- parental style
- external contraints
  reward, choice
  time, materials

COGNITIVE
- information
- attention
- fantasy
- metaphors

PERSONALITY
- risktaking
- conformity
- temperament
- locus of control

IDEATIONAL FLUENCY
- popular   • original

FIGURE 2: DEVELOPMENTAL-ECOLOGICAL MODEL OF CREATIVE POTENTIAL IN YOUNG CHILDREN

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Design and Evaluation of a Creativity Training Program for Elementary-School Teachers

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Creativity constitutes a topic which has been the focus of many studies and discussions by psychologists and educators in the last few decades. Societal needs of creative individuals were recognized as well as the role of creativity in the process of changing history and improving society. A great interest in the characteristics of creative people is observed, together with an increasing effort to provide conditions which would contribute to its full development in the child.

This picture is not true, however, in most underdeveloped countries, as Brazil, where the creative abilities have been traditionally ignored in the educational context. An emphasis upon authoritarian methods and rote memory of facts prevails in the schools, with few opportunities for the deliberate development of creative thinking and problem-solving skills. The educational emphasis is still on "dead knowledge" as written by Whitehead more than 50 years ago in his book "The aims of education" (1929), when he stated the need of enlarging the number of abilities trained in the school setting.

Besides the emphasis on memory and reproduction of facts and concepts, there are several misconceptions about creativity and ways of implementing it among teachers. It is believed, for example, that

creativity occurs in artistic activities only, with the art teacher being the one responsible for the nurturance of children's creativity. Creativity is also visualized as a question of all-or-nothing. Consequently, every person is seen as creative or non-creative, and most people do not understand that creativity is a question of degree, being some individuals more creative and others less creative. The following statements that are heard frequently from teachers illustrate this belief: "I have absolutely no creativity" or "I do not have any creative students in my class."

The idea that creativity consists in a flash of inspiration which occurs in some individuals without an explainable reason as if it were a magical touch is also common among elementary school teachers as well as the belief that creativity depends only on personal factors with an underestimation of the influence of school and society to the creative process.

Besides these misconceptions, we observe several obstacles to the development of creativity in the Brazilian school setting. One of these obstacles is the content and extent of our curriculum program. In an analysis of the Brazilian textbooks in the field of science, geography and history, which have been adopted in our schools, we observe that it is surprisingly high the quantity of information—dates, names, concepts and principles—children are supposed to learn during the school year. The period of time children stay in school is also short (no more than four hours in the public school). In general, time is not enough to cover all the programs. Consequently, rote memory of facts prevails, with few opportunities to develop exploratory activities, to test ideas and to make use of the children' creative potential.

Another obstacle is the traditional view of teaching, which predominates in the school setting. Teaching is seen, traditionally, as the transmission of information, being the teacher's duty, with the help of the textbook, the transmission of the knowledge, which constitutes the raw material to be assimilated and learned by the students. There is a tendency for the books to be expositive and informative. Children are not seen as responsible for the construction of knowledge and the emphasis is in memory and not in comprehension.

There is also an exaggerated emphasis on children's discipline and "good" behavior. In order to transmit the required content of the program, which should be reproduced by the student, certain characteristics are required from them, such as obedience and attention.

The ideal student, who is desired by all teachers, is one who is quiet and attentive; is one who does not question, does not criticize, does not suggest alternative ways or new approaches. This model of student is one factor which conducts to the uniformity of behavior, thinking and expression, repressing divergence and spontaneity.

The knowledge of these misconceptions and blockages to the development of creativity in the school setting, besides the data obtained in several studies (Alencar, 1976, 1984; Alencar & Rodrigues, 1978) which indicated both teacher's influence in creative abilities and the presence of a psychological environment not favorable to the development of children's creativity in school, led me to develop a creativity training program for elementary-school teachers, which was designed to instruct teachers in techniques and exercises which might be used in the classroom to foster creative abilities in the students as well as to make teachers aware of their own creative thinking abilities, which most of them ignore.

This program has been conducted in 10 weekly sessions of three hours each or 15 weekly sessions of 120 minutes each. Different topics related to creativity and how to nurture it in the school setting are discussed in each session, such as the cultural obstacles to the development of creativity and the characteristics of a classroom climate that favors the creative expression.

In each session, questions are given to the teachers to be answered individually or in small groups and discussed later by all members of the group. Some of these questions are: Why is it important to foster favorable conditions to the development of creativity? When we say that someone is creative, which are his most important characteristics? In which way can society contribute to foster the creative behavior of its citizens? How can you foster a creative classroom climate?

In some sessions, teachers are requested to develop exercises or activities which could be used in the classroom to implement some creative thinking abilities or the strengthening of personality traits related to creativity. These exercises and activities are typed and distributed to all teachers, with the suggestion of applying them in their classroom, bring back children's responses in a later session.

During the sessions, teachers are given a brief text to take with them to their schools. These texts constitute a simplified version of the main topics of the program extracted from the book *Psychology of Creativity* (Alencar, 1986).

Studies (Alencar & Fleith, 1987; Alencar, Fleith & Rodrigues, 1987; Alencar, Fleith, Shimabukuro & Nobre, in press) developed with this program indicated that it has been successful in helping teachers to learn the skills which are related to creative thinking and how to further it in the classroom. It was observed that most teachers considered the creativity training program very useful to them, informing that changes occurred especially in their teaching methods and in their students' perception as a consequence of its application. It is the opinion of the author that more training like this should be offered to teachers, in order to make them aware of their own creative abilities and ways of favoring the development of children's creative abilities in various fields, and not only in the arts, as it occurs nowadays.

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Intuition, Creativity, and Human Freedom: Rationalism and Irrationalism

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For several hundred years, consideration of complex human phenomena has been shot through with two contrasting perspectives. At the extremes, this bipolarity can be represented by "rationalism" at the one end and "irrationalism" at the other (Barrett, 1958). By rationalism, we mean an approach to knowing which is based on analysis, linear logical progression of argument, consistency, and explicitness of steps, all leading to proof. This is the kind of value or virtue of thinking which has dominated the Western world since the late renaissance, certainly since the enlightenment, and almost totally since the industrial revolution.

In contrast, irrationalism is typically caricatured as emotional, slovenly, uncoordinated, non-progressive, vague, muddled, leading to false conclusions, and so on. Actually, irrationalism is properly none of these things. Irrationalism involves holistic approaches to understanding, is suspicious of analysis, incorporates affect along with reason, is concerned with aesthetics, may be non-linear, and is more interested in understanding and intelligibility than in explicitness of proof.

It is true that rationalism has had a salutary effect in bringing us out of complete mystery and bafflement with what we see around us.

Rationalism laid the foundation for what we now know as normal science, and without rationalism the technology which both serves and rules us would be impossible. However, coming under the domination of rationalism has also had costs. We have tended to focus on the analysis of phenomena, we have come to believe that we can disassemble a problem, solve bits of it and put it back together for a full solution. We have come to believe that if some solution works for some part of a problem, more of the same will work for a larger problem. Our tendency to see things this way is rarely examined, and examination rarely comes about without the intervention of some kind of cataclysm.

Two such cataclysms have brought our attention to this kind of thinking in the past generation. The advent of nuclear power and the advent of the electronic computer. The early implications of each of these were very optimistic for most people: Nuclear energy could provide a dramatic boon for all, and since it had been used to bring the end to a war, more of the same might well serve to maintain the peace. Similarly, the rapid development of the computer during the 1950's and 1960's showed that these devices could do many things that humans could do, but the devices could do them faster and more accurately. More hardware and more software, and the machines would become more like humans. In some respects they surely have.

However, we have already seen that the problems of maintaining peace may be wholly unlike the problems of ending a war, and more and more nuclear technology has not brought us any closer to world peace than we were before. Similarly, while the computer has grown to accomplish remarkable things, it has also brought headaches through depersonalization and the mechanization of human contacts, and perhaps worst of all it has brought us to think of the human being as a near-computer rather than the computer as a near-human.

There have been some episodes of revolt against the rising tide of rationalism. One such event was the great upsurge of romanticism in Germany during the 1930's and another, somewhat more benign rise in irrationalism, was the hippie movement of the 1960's. Each of these was ultimately coopted by or overwhelmed by the dominant rationalist perspective. Within psychology, the dominance of analytical reductionistic rationalism is evidenced in the way in which analytical behaviorism simply wiped out the influence of the gestalt and *verstehenist* schools of thought for more than fifty years. These latter views

never really died, but they were certainly under-represented in the mainstream of psychology and indeed misrepresented by mainstream historians.

Within psychology, we may be on the threshold of a new resurgence of irrationalism—in the best sense—a resurgence of concern with human complexity, with the intricacy of interpersonal relations, with appreciation of humans and their unique talents, capacities, and powers as whole, intact human beings. This view is challenging the view that humans can be understood as assemblages of analytically describable and controllable components. I suggest that at the present time, throughout the world, questions are being raised concerning the primacy of the rationalist perspective, especially as it has been the cornerstone of normal science and is the foundation of the continuously expanding and continuously threatening impact of technology. We may come to the conclusion that the technological analytical mentality as an approach to understanding human action is simply not equal to the task.

So I would like to look briefly at the three subjects of my title with the rationalist and irrationalist perspectives in mind.

First of all, intuition has been studied by psychologists almost not at all. From the dominant rationalist perspective, the phenomenon is to a large extent, suspect, but there are definitions of intuition to suit every taste. At one extreme is intuition as the acquisition of near-mystical direct knowledge of absolutes like beauty, truth, knowledge of God, and so on. Another view is that intuition is an absolutely fundamental primitive function of all thinking, which takes an individual from sensation to knowing. Further along the spectrum is the notion of intuition as unconscious inference, different from ordinary inference only by its obscurity. Finally, there is the idea of intuition as a learning or knowing process in which one is totally involved, affectively, as well as intellectually, and which characteristically has a profound influence on one's view of the world. This, of course is only a small sampling (Cf. Bastick, 1982; Westcott, 1968; Wild, 1938).

However, with all these conceptions, there are only two research-based scholarly books in the entire psychological literature dealing with intuition. A recent survey (Bastick, 1982) of more than 2½ million abstracts yielded only 24 psychological studies, and most of these are from a rationalist perspective. That is, attempts to break the phenomenon into its parts, place them in a more-or-less linear rela-

tionship, and then reconstruct the phenomenon as an assemblage of more fundamental activities.

This rationalistic perspective has led to a resurgence of interest in intuition in the realm of artificial intelligence, that is, attempts to break the phenomenon into its parts, place them in a more-or-less linear relationship, and then reconstruct the phenomenon as an assemblage of more fundamental activities.

This rationalistic perspective has led to a resurgence of interest in intuition in the realm of artificial intelligence, that is, attempts to produce intuitive or expert systems of problem-solving on a computer base. The computer is, of course, infinitely rational, performing perfectly explicit computations on perfectly explicit information with dizzying speed. Computers can reach rational decisions and solve rational problems that most people can't. But when it comes to the final judgments made by human experts, the explicit computational skills of the computer begin to fail and the human intuitive judgments which make genuine human experts are beyond them. The ultimate activity of human judgement may be of an entirely different nature than the computational wizardry of the computer. Rationalism hits the wall (Dreyfus and Dreyfus, 1986).

Within the realm of creativity, much the same can be said. Psychology ignored the wonders of creativity to a very great extent until 1950 when Guilford (1950) published a call for the study of this important phenomenon. The rationalist approach followed. A great creativity industry was born, with attempts to analyze the nature of creative products, the nature of creative processes, the nature of creative persons, and attempts to identify universal features, principles, or laws governing the phenomenon. This, of course, was the dominant mode of study in psychology and the dominant aspiration-o-to render the discipline and the phenomena it studied in a fully rationalist model.

But one of the most successful areas of study in creativity was based on inexplicity, intuitive judgments. It utilized judgments of architects in selecting the most creative of their peers (MacKinnon 1964). The bases for judgement were not explicated, but there was a very high degree of agreement on who the most creative architects were. These people were then invited to Berkeley and were studied from a great many different perspectives. What was found was that the most creative architects, however identified, shared some broad general characteristics—an interest in high-level abstractions, openminded-

ness, flexibility, independence, willingness to take risks, comfort with their own unconventionality. In these features, they differed from a control group of undistinguished architects, but they did not differ from another group of architects with whom they worked as colleagues. This latter finding is made much of by Weisberg (1986), who is very critical of all the "general findings" which have become to be believed about creativity. For example, it might well be that the identified "creative architects" are different from their immediated co-workers primarily in terms of their own PR work or having caught the crest of fashion. Identified creativity may often be a matter of having gone beyond the ordinary in ways which are (for the moment) widely approved. This is certainly the case in those realms where aesthetic judgment is involved.

But note that the effort was to analyze the individuals into components, with the rationalist expectation that the analytical components could be conceptually reassembled and the original phenomenon reconstituted. From this perspective it is possible to identify, in an assorted group of people, those most likely to produce a creative product. But that is not the same thing as comprehending creativity in the individual.

So the rationalistic approach to the analysis and psychological characterization of creativity may provide immediate truths, without providing much which transcends the immediate. Indeed, Gergen (1973), has argued that most of the findings of social psychology are historically contingent, and that today's truth is not tomorrow's truth.

Finally, we come to human freedom, a conception which has fascinated mankind for millennia. It is also a conception which strikes fear in the hearts of psychologists dedicated to a fully rationalist and determinist universe. It is argued that there is simply no place for freedom or indeterminism in human action in a scientific psychology. This issue engaged the founding fathers of psychology on both sides of the Atlantic. William James opted for a conception of free will and freedom in his view of humankind, although he agreed that for a scientific psychology, it had to be excluded. But he also argued that a scientific psychology as then conceived would be a very limited discipline in accounting for human action (Viney, 1986). Similarly, Wundt named his social psychology "Voluntarism", and considered volition a basic issue for psychology: not a problem to be reasoned away, but one to be dealt with as a fundamental feature of human behavior. Further,

there is a continuous line of concern with human freedom and volition and a concern with the notion that humans act with respect to the future: They act as much ". . . in order to . . ." as they do "because of. . .". Human behavior can be explained as often by reasons as it can be by causes.

However, in the mainstream of psychology, freedom in human action has been dealt with as illusion (Lefcourt, 1973), as appearance (Mandler and Kessen, 1974), as mischievous (Skinner, 1971). The two main traditions of experimental psychological research on human freedom have trivialized human freedom both in conceptualization and in operationalization. Reactance theory, a research tradition dating back more than two decades (Brehm and Brehm, 1981), is founded on the notion that people often believe they have behavioral options, and when thee options are threatened or eliminated, people will act so as to re-establish them. Actually, the research studies rarely investigate this, and instead opt for the more-easily appraised change (usually an increase) in attractiveness of the threatened options. The fact that the theory is based on a fundamental human belief in freedom of action is taken to be a simple more-or-less inexplicable given, and essentially no attention is paid to the value, utility, or possible truth of this belief. The same can be said of the studies of human freedom in the tradition of attribution theory (Harvey, Harris and Lightner, 1979). Here, the same kind of stance is taken—people often attribute freedom to their own actions or the actions of others, and the conditions under which this occurs, and the consequences of these attributions of freedom are the focus of study. The logical status of such attributions are not of concern (CF. Westcott, 1988, ch. 3, 4).

This is true in psychological research on human freedom, in spite of the fact that human freedom has been a subject of continuous study in philosophy, history, anthropology, and jurisprudence for as long as these disciplines have been practiced. The classical approach of psychology has been to either ignore the matter of volition or to reduce it to some more primitive, ideally neurophysiological, status (Kimble & Perlmuter, 1972).

In contrast, a few efforts, including my own, have tried to deal with human freedom as a genuine feature of being human, and have explored the conditions of human freedom, the experience of human freedom, and paradoxes of human freedom. This ubiquitous phenomenon, taken seriously does not lend itself to a fully rationalistic,

linear, deterministic analysis or understanding. To the extent that such an understanding is attempted the understanding will be deficient.

I have focused here on three important human phenomena — intuition, creativity, and human freedom, and I have pointed out the ways in which I think the dominant rationalist perspective on understanding has truncated our psychological understanding of these. We are talking about complex, individualistic, and peculiarly human functions, and attempts to reduce them to linear causal chains of less human and more mechanical functions may not only lead us away from understanding, but may lead us into fundamental error: the error of believing that more or better of the analytic elements will ultimately produce the complex phenomenon of which the analytic elements are a fragment.

To the extent that the psychological study of intuition, creativity and human freedom have suffered from a rationalist domination, I suggest that the study of creative, gifted, and talented youth may suffer from the same kind of bias. I know that there is an established tradition of qualitative, global research in the field of education, but that it is still marginal. Psychology fell into much of its sterility trying to emulate physics, and educational research is in danger when it emulates this traditional psychology. The phenomena of intuition, giftedness, creativity, talent, and human freedom are complex, idiosyncratic, various, and demand study on their own level rather than study by reduction to the pale shadows cast by their analytical fragments.

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Creativity, Learning, and the Specialized Brain In the Context of Education for Gifted and Talented Children

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I'd first like to explain that I do not work directly with children, so I translate from my experience with adults for my understanding of children's giftedness and talentedness. I actually work with big business; with corporations. But corporations, like children, have a range of potentials, so I've translated from corporate high potentials to gifted and talented children. Included in my data base are many thousands of human resource professionals, teachers, academics, school administrators, and also a group of about 4,000 high school students. But my data base is primarily corporate America. In terms of interests, I believe that all of us are kindred spirits. Our common interests are separated, perhaps, only by language. What I would now like to do is acquaint you with my specialized language, which is the new language of brain dominance technology.

My story starts with my own duality, which was the basis of my interest in creativity and the brain. As a young man, I excelled in science and math, but I also was a musical performer. I graduated from college with a double degree in nuclear physics and music. At the age of 45, I took up painting and sculpting and over the next 15 years, created a body of work of some 600 paintings and 100 sculptures. As I contemplated my own behavior, I wondered where all that creativ-

ity came from. What was this duality between science and the arts in me? In my pursuit of the answer, I delved into the nature and source of creativity; and in the process, I "rediscovered" the brain. I learned that we all have dualities—not just one, but perhaps multiple dualities. (Think of the options your own interests have given you, both when you were young and now.)

In pursuing the nature of creativity and discovering that its source was the brain, I really came to grips with what I think is a fundamental understanding. If the brain truly is the source of creativity (and it must be), then all human functioning is affected by the way we think.

People ask, "Ned, what is your definition of creativity?" But I really want to avoid defining it, because for each of us it has a different meaning. The following statement is as close as I would like to come: Among other things, creativity is the ability to challenge assumptions, recognize patterns, see in new ways, make connections, take risks, and seize upon a chance. Of course, all these aspects of creativity come from the brain. The human brain is something which we as a culture, we as a civilization, we as a people, we as individuals, have not done our homework on. We don't teach the brain. We should! Most of us don't understand it. We need to. It's important for us to grasp the overall significance of the brain, because, in point of fact, every emotion, every thought, dream, act, bodily function of our waking and sleeping self is ruled by the brain—a vast network of neutral activity. Most of us know more about our domestic plumbing or our automobiles than we know about the brain. I'm going to try to deal with that issue in this article.

We are living in a time of explosive new knowledge about brain functioning. In fact, neuroscientists claim that we have learned more about the brain in the last decade than we learned throughout all the ages that went before. Must of what we have learned is expressed in two basic theories about brain specialization.

One of these theories is the left hemisphere/right hemisphere concept, which emerged in the early 1970s. Though the details of this form of specialization are still being discovered, generally the left hemisphere is specialized for linear, sequential processing, while the right hemisphere focuses on simultaneous, gestalt operations. Thus analysis, mathematics, and linguistic structure are all more efficiently processed in the left hemisphere while spatial relations, images, and abstract concepts are more effectively processed in the right hemisphere. The left brain is the step-by-step, disciplined, rule-

oriented processor, while the right brain is more of a kaleidoscope of simultaneous processing.

The other major theory of brain specialization is the triune brain theory. Developed by Paul McLean of the National Institute of Health, this theory proposes a form of specialization not in terms of two halves of the brain, but rather the successive evolutionary development of major structures of the brain starting with the brainstem. This is the reptilian part of us which is the more autonomic, the more primitive part. As we further developed in association with other early human beings, we needed an emotional processing capability so the limbic system capped that reptilian brain. In addition to emotions, the limbic system deals with form and structure, and very importantly deals with the transformation of information into memory. This associates emotion closely with information processing. Feelings now become a valid and very significant part of the processing of information and of learning itself. As we further developed in the evolutionary process and became more civilized, a sophisticated cortex or "thinking cap," developed around the limbic system. It is in this cerebral cortex that abstract thought takes place. The notion of the triune brain is successive specialization from the brainstem up.

The Herrmann four quadrant brain dominance model can be thought of as blending of left brain/right brain and triune brain concepts into a physiological based metaphor of how the human brain works. It is a metaphor which permits us to move beyond the strict physiological location of specialized modes, and deal with the brain system as an abstract concept with, perhaps, more clearly defined boundaries than neurophysiology allows. We now have a whole brain model based upon the dichotomized and the triune brain notions. This model is made up of four separate quadrants: A,B,C, and D. We have the logical, analytic, quantitative, fact-based A quadrant, metaphorically representing the left hemisphere of the cerebral cortex; and we have the planned, organized, detailed, sequential B quadrant representing the left half of the limbic system. These two together make up the left mode thinking processes. Additionally, we have the emotional, interpersonal, feeling-based, and kinesthetic aspects of the C quadrant metaphorically residing in the right half of the limbic system; and finally the holistic, intuitive, synthesizing, and integrating modes of the D quadrant, which is based upon the right cerebral brain. Taken together, C and D make up the right mode. Thus, we have left and right modes and cerebral and limbic modes—four different but equal parts of the brain system (Fig. 1).

THE UNIVERSE OF THINKING STYLES
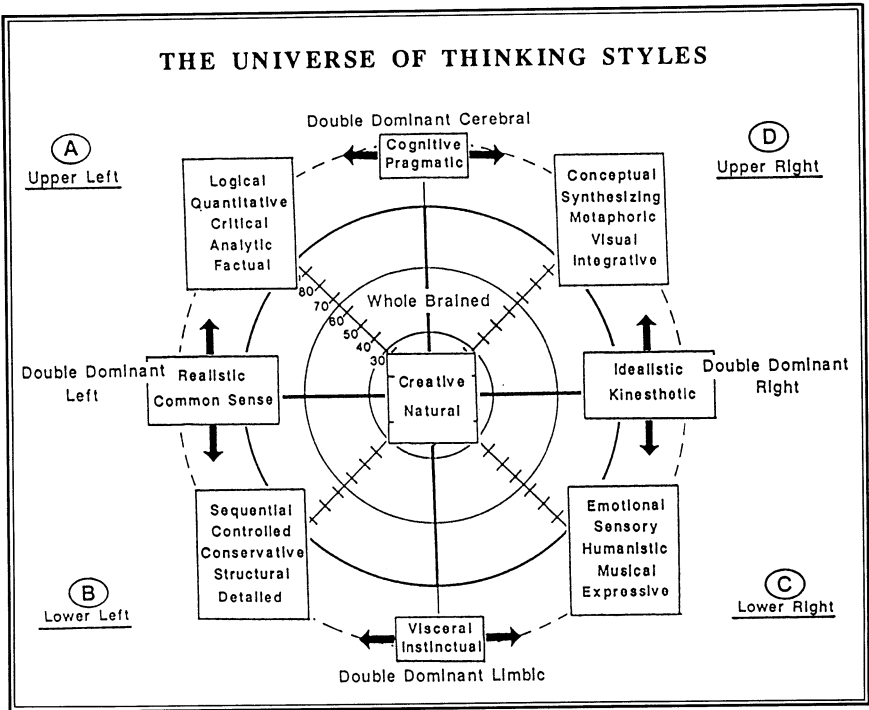
FIGURE 1

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One way of categorizing the four dimensions of the model is: A-know it; B-do it; C-sense it; and D-try it. These specialized modes lead immediately to different learning styles. The A quadrant learns by acquiring and quantifying facts, applying analysis and logic, thinking through, building cases, forming theories. This learning style is in contrast with the B quadrant which learns by organizing and structuring concepts, sequencing, evaluating, testing, acquiring skills through practice. This in turn is quite different from the C quadrant which listens and shares, integrates, experiences, moves and feels, harmonizes, and has emotional involvement. The D quadrant takes initiative, explores different possibilities, relies on intuition, is interested in self-discovery, constructs concepts, and synthesizes.

The Herrmann Brain Dominance Instrument is based on the metaphoric model. In interpreting the resulting data, I emphasize that I do not consider the Herrmann Brain Dominance Instrument to

be a "test." That would imply right or wrong or good or bad. Rather, the instrument is simply a model showing a distribution of mental preferences in the form of a four-quadrant profile.

I want to differentiate between a preference for certain mental activities and the competence to perform those activities. These are two different things. However, they are strongly linked. Think back for a moment to when you were in school. Think about the subject that you did best in—one that you really excelled in, a subject that was easy and fun, one that you were turned on to. Hold that in your mind and then think about the subject you did the worst in. Now, contemplate trying to get a PhD in both. It isn't that you couldn't, but you would obviously achieve your doctorate in one of them sooner, more easily, and at a higher level of academic attainment.

Though we may function in an area that is not preferred, our preferences can be like blinders on our eyes, altering our perception. Imposing such blinders on our view of gifted and talented programs can have a devastating effect. Picture a person who is examining a child to determine the child's degree of talent, and this person is evaluating the child through the perceptions imposed by his own dominance pattern. In so doing it's very possible that he doesn't see the whole child. But it's on this limited basis that he makes a determination. A decision based on one's own dominance will not necessarily reflect the child. We end up with some children selected correctly, more who are selected incorrectly, and even more who are not selected at all. The consequences are devastating.

Lest you think this just happens when adults evaluate young people in school, you should be aware that it occurs with older people in business as well. In one study involving one of the world's great corporations, I compared the profiles of five groups of "high potentials" (the corporate version of "gifted") with the profiles of their sponsoring managers. There was a strong correlation between the profile of these high potentials and the managers who designated them as such. Is it possible that we select people in our own image? Is it possible that others are overlooked because they are different?

In the brain dominance model, we are talking about a group of specialized languages that deal differently with facts, forms, feelings, and futures. A famous Abraham Maslow quote says, "If your only tool is a hammer, isn't it amazing how many things begin to look like a nail." I think we should be alert to the fact that ignoring language differences can be counter-productive.

It is essential for us to understand that the brain dominance concept deals with personal differences and uniquenesses and not with good or bad, or right or wrong. As with handedness, mental dominances just are! We all tend to have these preferences and we should think of them more as potential sources of competencies than as problem issues. Our preferences for one mode or another inevitably lead to preferred thinking styles. For example, the thinking style of the upper left A quadrant is that of analyst, and of the upper right D quadrant, that of synthesist. The lower left B quadrant is conservatist. Finally, the humanistic feelings of the C quadrant represent thinking just as much as the fact-based modes. They are just different approaches. (I hope that we as a people — as a culture — can begin to understand and accept this feeling mode of thinking as equal to the more cognitive modes.) The combination of analyst and synthesist is pragmatist. The combination of conservatist and humanist is visceralist.

In building a more comprehensive universe of thinking styles, we can identify some key concepts as belonging to particular modes: Common sense is in the left mode. Kinesthetic is right mode. Instinctual is visceral. Cognitive is pragmatic. Creative and natural are whole brain terms.

Using a different language now and thinking in terms of "smartness," it is possible to identify a whole array of concepts, including factual smartness and visual smartness. Some people have one or the other. Some have both. There is procedural smartness and emotional smartness. There is, or course, intellectual smartness, a gift for which frequently draws people to academic positions. There is also street smartness, a common trait of entrepreneurs. There is organizational smartness and social smartness; academic, artistic, administrative, and musical smartness, to name a few. These different types of smartness have a bearing on our role as educators and as persons who deal with gifted and talented people and those classified as high potentials.

Mintzberg, in his article, "Planning on the Left, Managing on the Right" (*Harvard Business Review*, July/August, 1976), raised the question, "Why is it that some of us are so smart and dull at the same time; so incredibly capable of certain mental activities and so curiously incapable of other activity for smart people." We all seem to have this array of "smartness" and "dullness." Upon reflection, that includes me, my staff, my associates, my wife, my children, and

my friends. It's quite normal that we would not be equally smart across all of the mental functions available to us. My view is that half of being smart is knowing what you're dumb at. This can be an important clue to the direction and method of our own development as well as the development of other people.

One of the things I have learned myself is that many of us have our own ogres that prevent us from being as creative as we would like to be. For me it was a fearsome dragon guarding the entrance to my creative castle. But this ogre proved to be just a toy rubber dragon—one that I, myself, was inflating to monstrous proportions. So at the same time we attempt to reach our castle of creativity, we block the way with our own internal issues. One of those issues is simply the difficulty of dealing with being creative in the first place. Often there is resistance every time we attempt to be creative. Sometimes we are scared by the power of our own imagination. Then we say, ''Oh no, not me. I can't be creative!''

Because of their fundamental uniqueness, people have very different views of creativity. One of the things I do in my research is to ask people about the most creative person they have met and by diagnosing their answers, I learn something about their own mental preferences. If you were to create a logo of yourself, the materials you chose and how you assembled these materials to represent yourself would reflect your mental preferences. Our behavior in such tasks represents our own creative process in action; and what happens is indeed a process, not just a single event.

The creative process involves the whole brain and certain discrete phases or steps: interest, preparation, incubation, illumination, and application. That these five classic steps are the principal characteristics of the creative process has been confirmed in my research of history, from noting creative events during my own long associations with the General Electric Company and the Stamford (Connecticut) Art Association, and from observing the way I myself work. Based on this process, I've developed a model of creativity involving the whole brain. Applying the model to a creative task could be described in this way: Our preparation would start with an accumulation of the facts. We'd analyze the facts, do some preliminary organization and planning, and some logical processing. We'd further categorize and organize the materials as they unfolded; we'd process the numbers; and as we processed them, we might see a concept or a pattern emerge which in turn might stimulate a sensory response confirming

that we were on the right tack. We would then verify that response. As we continued to process in this manner, we would go back and forth in preparing and verifying, contemplating and sensing, and along the way, perhaps we may have drifted off into a daydream around some visualization which occurred. This would lead in turn, to an Aha! of illumination. The gut reaction in response, again, would be very positive.

In this simple example of the creative process, I've involved the whole brain. To help describe the process, I've cleaned it up. I have over-organized it to communicate the idea, but of course it isn't that cut and dried; the actual process is quite complicated and very messy. A good metaphor is "zigzag lightning" in the brain. If we try to straighten up the process, then we will likely shut it down. If we avoid a part of the process, we tend to disable it. When we actively avoid any aspect of the integrated whole, we turn off our creative process. Because creativity is whole-brained, we must assume that giftedness encompasses the whole brain. If we are to serve the interests of the students, teachers, parents, and administrators, we really have to change our way of thinking about the mental aspects of giftedness.

I am constantly re-impressed by the creative capability of people who never thought of themselves as creative, but who, when facilitated into accessing their creativity, clearly are. Importantly, there appears to be no real time constraints to limit our ability to do this. It is as if our creativity is ever-present, awaiting our recognition of its availability, no matter how old we are.

We must assume that everyone is capable of being uniquely and personally creative. Creativity is not a privileged domain for the select few, but rather a part of life available to all of us. When we assume that a person is not creative, and worse, when we teach a person that he or she is not creative, we stifle an important part of that person's life. When we assume that a child is not gifted or talented, without first seeking to discover the child's gifts and talents, we stifle that child's potential.

In order to better understand the relationship between competence and preference, I need to differentiate between what I call a "primary" or the strongest preference, a "secondary" which denotes our intermediate preferences, and a "tertiary" which indicates our least preference. The tertiary preference is where we experience the most difficulty, and in some cases even avoid learning. We stay away from it as opposed to preferring it. Our strongest preferences lead to

our greatest competencies and our avoidances lead to our least competencies. In terms of learning strategy, we should affirm or extend our preferences. We should reinforce and develop our secondaries and be stimulated and challenged in our areas of avoidance. I do not feel that we should let students off the hook (or ourselves for that matter) in areas that we have not yet accessed or developed. Many of us do not even know they exist, and so we need to find ways to stimulate and challenge them. Competency potential then ranges from world-class to hopeless. As educators we must understand that as we move individuals into situations out of their area of competence, we should have different expectations of their ability to learn and perform.

In big business, we risk this all the time as we move people from job to job, often ignoring the fact that they might have different preferences that result in a set of competencies more appropriate to other areas of work. That situation can be very counter-productive to all concerned. I believe that we can be experts situationally across a rather wide area of primary and secondary degree to which we can utilize different modes and quadrants as the situation requires.

There's a danger in being different, not only in school and business but also with our own family. On one occasion a father said to me, "Let me tell you about my kid, John. I mean we're talking weird. We don't understand this kid. My wife and I even joke about the possibility of a mistake being made at the hospital. We don't like the way he looks. We don't like the music he listens to and we can't stand the occupation that he has chosen. We are frightened by his future. Would you please do a brain dominance profile of John and the rest of the family?" Of course I agreed and the resulting profiles reveal John's extremely strong D quadrant preference and the rest of the family's contrasting A quadrant preference. This situation became the Weird John Syndrome. John is weird because John is different; and John is different in an area where difference is visible —its visible in hair, dress, friends, and in speech. It's visible in educational direction, it's visible in occupational choice, and it's visible in educational direction, it's visible in occupational choice, and it's visible in everyday behavior. To better understand the differences between John and his family, I invite you to fantasize about John talking to his friends about his "weird family." John's family is a homogeneous tribe; and as a tribe spent, as the father said, 26 years digging a moat, building a wall, and inventing weapons to keep John out, all

because he was different from the family tribe. I like to ask audiences, ''Do you know a Weird John?'' ''Are you a weird John?'' The Weird Johns of this world know about the power of this model and the impact of being estranged by simply being different. But the world needs Weird Johns because they frequently have the answer — they just often don't have the best way to convey that answer.

I have a very strong feeling that most of us have some Weird John in us and should honor those characteristics because that's where much of our creativity comes from and where much of our ability to deal with innovation and change can come from. We joke about it in others and suppress it in ourselves. Paul McCartney said, ''I used to think that anyone doing anything weird was weird. But I suddenly realized that anyone doing anything weird wasn't weird at all. It was the people saying they were weird that were weird.''

In my past corporate culture, and perhaps yours also, we used to say, ''You're flying out of formation again, Cunningham,'' because Cunningham looks different and behaves differently. A few years ago I did a study of 50 people who were described by their friends as ''the most unique person in my life.'' The average profile for this group of 50 successful but unique people looks very much like Weird John. We must begin to honor differences. Let's not always cater to our natural inclination to be homogeneous. That can be very comfortable, but can frequently lead to mediocre solutions and decisions.

Our preference for different modes leads to the use of brain dialects that are equivalent to different languages. To illustrate, I will relate a story about the building of our home in North Carolina. Our architect flew in from Portland, Oregon, to help us design the house. The building site was on a mountain ridge overlooking a sparkling lake and surrounded by a ring of mountains. It's really quite spectacular. On a clear September day, the architect walked out onto the partially cleared site with sketchbook in hand and looked out at the lovely scene. He stood there without saying anything for what seemed like too long, because I was really curious about his reaction. Finally I said ''Well, Lou, what do you think?'' And Lou said, ''Wow! What a place to build a home. I could build a cathedral here. This is a place where you could live forever. Thank you for the opportunity to help you design this special place,'' He then began to sketch the first few lines. One year later, the builder I had selected stood in the same place. It was another beautiful day in September. I

just couldn't resist asking the builder the same question. "Well, Grover, what do you think?" Grover looked out at the same spectacular scene and said, "Oh, I've see a lot worse than this!"

The builder and the architect were simply coming from two different sets of preferences that led to two different perceptions, expressed in two different ways, even though they were looking at the same scene. For many of us, one thing goes in and quite another comes out. We are simply on different wave lengths from each other. The variations in our ability to communicate effectively are based upon either our mental similarities or our differences. Every once in a while we have this exquisite understanding that comes between best friends or spouses where it's like magic and they understand. Then we have other experiences that are very different. For example, we use the word "measure" with the thought that everyone understands immediately what we mean; but course they don't. Some have a highly precise understanding of it in the A quadrant and some are perfectly content to approximate it. Others are wanting to sense it, others are wanting to evaluate it. We say "plan," and we never specify what we mean. Do we mean tactical, human, strategic, or financial? Other people hear it in terms of their own preferences. We say "money," and we might mean we've got ways to count, ways to save, ways to help, or ways to spend, all of which are very different ways to think about money. There is the high tech aspect of quadrant A and the high touch aspect of quadrant C. *MegaTrends* says we better begin to get those together if we're going to survive in the future. There are also the high tech aspects of quadrant D and the high time focus of quadrant B.

Out of these brain dominance concepts developed a model of what I call whole brain teaching and learning. In the A quadrant, we deal with rational, cognitive, and quantitative modes. All are important and are basically fact-based. In the B quadrant are the organized, sequential, procedural aspects of learning which, taken together with A, are the most structured and verbal part of our processing. In the C quadrant are the feeling oriented emotional, expressive, and interpersonal modes which contrast with the controlled A and B. The D quadrant contains the visual, conceptual, simultaneous aspects. C and D taken together are experiential and nonverbal.

These are four very different modes; and if we as designers and teachers ignore these differences, the student will simply not understand. The person who is strongly oriented to one particular learning

mode will tend to find and reject or not process effectively the other modes. Again, the world as a whole is a composite whole brain, and so we must now begin to change our assumptions about the learning styles of our students to accommodate those who think in ways different from ourselves and our schools.

We can describe training elements in terms of this four quadrant model. Activities in the A quadrant include analyzing, objectifying, articulating, and finance training programs. In the B quadrant are planning, organizing, administrative, and evaluative activities. C quadrant includes interpersonal, team oriented, and emotive activities. In the D quadrant we conceptualize, strategize, design, and integrate. The four quadrants can also be thought of as A-technical; B-traditional; C-humanistic; and D-experimental. So if you have system that is heavily oriented towards B, it's going to be traditional in all its modes. If you try to place experimental activities into a traditional school mentality, it won't work. There will be immediate resistance and it simply will not work.

In identifying gifted and talented children, I believe that we've been overselective and have used the wrong criteria for that selection. My experience over the past decade of using whole brain teaching and learning methods provides overwhelming evidence that we all have latent creative potential that can be accessed and made visible. "Creativity is the breaking down of walls rather than the building of skills," realized a young man after attempting a sculpture for the first time. "I finally was able to slay the self-created dragon that prevented me from doing what I had wanted to do all of my life." We must summon the courage to attack the inflated dragon that blocks our personal creativity.

I'm constantly doing research as I explore my own understanding and try to push toward new frontiers. My most recent research involved asking 51 human resource experts to describe the master teachers in their pasts. From the data they gave me, I created a representative brain profile. I then asked them to describe the master learners in their experience. I profiled the learners as I had done the teachers. The combined results reveal an interesting overlap — both of them have the same D quadrant orientation. The master teacher is more A and C oriented and the master learner is more B quadrant oriented, but the common characteristic of both master teacher and learner was a preference for school superintendents are opposite to the master teacher's and master learner's profiles. School systems

could benefit from a leadership mentality that understands the mental preferences of teachers and learners.

When teachers say to me, "Ned, I don't understand whole brain teaching. What does it mean?" My answer is, "Most likely, it's what you are now doing that *works*. Take those things that you are now doing that really seem to work and diagnose them using these concepts, and you will discover that you are using many of these whole brain ideas."

From a pitcher's point of view, every batter represents a unique hitter. This being the case, those involved in the design and delivery of learning need to understand and apply the specialized approaches that represent the ingredients of the whole brain model. The A quadrant responds to formalized, data based content, business oriented cases, textbooks, program learning, and behavior modification approaches. The B quadrant respond to thorough planning sequential order, structure, lectures, organizational and administrative case discussions. The C quadrant is very different because we are getting into experiential opportunities, sensory movement, music, people oriented case discussion, and group interaction. The D quadrant, again very different, responds to spontaneity, free flow, experiential activities, experimentation, playfulness, future oriented case discussions, visual displays, aesthetics, individuality, and being involved. As educators, we have to reconsider how we are designing and delivering learning if we are going to serve the needs of learners who are potentially whole-brained and who are all potentially gifted or talented.

Whole brain teaching and learning refers to the brain's ability to iterate, that is, to move back and forth in order to take advantage of the situational applications of the brain's specialized modes. For example, if I asked you to multiply 9 times 12 in your mind, you would automatically access the quadrant specialized to do calculations. If I asked you then to talk about it, you would switch to the quadrant that is specialized to do that. If I then asked you to visualize this multiplication process, you would use the quadrant that is specialized to do that. In everyday mental process, we move back and forth situationally as the occasion demands. As I deal with key learning points in a teaching situation, I treat each learning point in as many modes as possible—frequently all four. During the course of a few days or a week or even a few hours, I design the delivery so that every key learning point is addressed in ways appropriate for all four quad-

rants. The learners must be thought of as a composite whole brain. I have enough data from enough sources to make that overall diagnosis. Taken as a whole, the world thinks equally in all four of these modes.

I have discovered that when working with groups, the creative capability is significantly higher when the group is heterogeneous rather than homogeneous. Homogeneous groups are mental tribes that quickly settle for a convenient, easy answer. Heterogeneous groups have to struggle together to get a better answer. There are lots of sparks. Sometimes there is pain, but the output of this mixed group can be significantly higher. I would like to suggest the possibility that each of us is, in fact, a heterogeneous person within ourself. Multiple dominances are not only possible, but the likelihood is that each of us possesses can be likened to a heterogeneous team. We have a four-way team of mental preferences residing in us. That array of preferences then needs to be understood as the basis of our learning styles. The "Three Person Problem" is my metaphor for the truly effective learning process: The teacher teaches the learner at such a level of independent understanding that the learner is then able to teach another learner. That learner then gives evidence that full understanding has been transferred.

I firmly believe that composite whole brain learning groups represent the ultimate teaching configuration. I realize this imposes an enormous administrative difficulty on people to assemble such a rare group, but I attempt to change the organizational culture of the businesses and schools I work with in order to make that possible. I solve that problem by gathering together people who are different and unique. In effect, I create a participant pool of interested learners that as a group represent a composite whole brain. This allows me to pick people in pairs, triads, and communities so that their similarities and differences provide an opportunity for them to learn from each other.

I continue to be impressed by the fact that out of the hundreds of people that I have trained in this whole brain teaching and learning concept, not a single one has elected to go back to the traditional modes. This approach is simply more successful and more fulfilling for them.

Keep in mind as you contemplate and interpret these ideas that the right brain invented the left brain. Think about the truth of that. Way back when we didn't have a need for our modern, sophisticated

brain. We did not have the need for organization and language and rational thinking, and then we became "civilized" and things began to change. As we assess the value of the left brain, my advise is: Don't leave home without it!? That's the part of us from which we derive most of our success in dealing effectively with life in this left mode culture in which most of us live.

A little left goes a long way. I say that because that part of our mental process is so powerful. Our left mode deals with fact and with verbal expression. Words and facts cannot only overwhelm others, they can engulf us as well. We need to deal equally with other modes—modes that are nonverbal, very soft, and very different.

Language can build a logical brain, but language logic can disable an artistic brain. Jerome Bruner has described language acquisition as the most significant of all life's learning experiences. It is so significant that it can block other modes of thinking. When I teach people how to draw and sculpt, my approach is to disable their language logic. By disabling their language logic and using only the simplest of art techniques, a way is provided for the learner to suddenly be able to "see." The dominance of language over nonverbal modes suggests that we reward children lopsidedly for vocabulary development, paying insufficient attention to other, nonverbal skills. For example, one of the accepted hallmarks of giftedness is a precocious vocabulary, so as we look around for clues of giftedness, a person with an enormous language capability is considered before another person with less verbal skills.

IQ tests are not a true measure of intelligence. My personal feeling is that IQ tests are an abomination. They give wrong information—either high or low. It's wrong because it gives you misleading clues as to what true intelligence is. High IQ scores do not ensure success. My experience with business people—with adults with whom I work—shows that there is no strong correlation between IQ and success. As a matter of fact, overspecialization can get in the way. A recent study showed specialization in advanced business subjects not common among the top 100 business people. Intelligence is more than lots of knowledge. It's also intuition, insight, and inspiration.

Thomas Mann, in *The Magic Mountain*, summed up our culture's view of language: "Speech is civilization itself. The word, even the most contradictory word, preserves contact. It is silence which isolates." A contrasting view is the Sufi proverb that "words have to

die if humans are to live." That may be an overstatement, but I want us to begin to understand the power of language as it compares with the power of ideas; and we have to treat this at a different level than we have in the past.

Albert Einstein, who was certainly one of the most gifted people in recent history, was not a strongly language oriented person. He said that when he examined his own methods of thought, "I came to the conclusion that the gift of fantasy has meant more to me than any kind of abstract thinking." He was talking about his preference for the D quadrant, not the A quadrant. As a matter of fact, those of you who have researched Einstein know that he didn't do well in school. He was basically a poor student. If he had been rigorously measured on this, he would never have been judged gifted as a child. Through visualization he dreamed the theory of relativity. Some of us would scoff at this and say it's not thinking. Of course it's thinking. It's just a different kind of thinking, and we need to validate it as appropriate in our education process. Today, we still punish students for daydreaming, when in fact, we dream every night every 90 minutes; and we daydream every 90 minutes during our waking hours, but our culture considers this inappropriate behavior and frequently says that daydreaming is a waste of time.

We have probably not even begun to discover the capabilities of our brains. As Michael Hutchinson put it, "It's as if we've been put-putting about without ever shifting out of first gear, never realizing that there were higher gears." Many of you are familiar with Howard Gardner's book, *Frames of Mind*, in which he develops the notion of multiple intelligences. He argues that a whole array of intelligences are co-equal, including linguistic, musical, spatial, logical-mathematical, and body-kinesthetic. I'm going to add a few more to that list: the academic and the nonacademic, the tacit and the practical.

An important idea in the area of gifted and talented programs is the notion of "islands of brilliance." Islands of brilliance can take on a number of different modes. They can be language based, musical, or artistic. They can be mathematically or scientifically oriented. They can relate to any of our many intelligences. I believe that all human beings have an island of brilliance. Some of us have more, but all of us have at least one. Since many of us don't know what our islands of brilliancies are, one of the things I do as I try to deal with

the issue of personal creativity is to help disclose to people, and access for them, their islands of brilliance, some of which they didn't realize they had.

Among the techniques I use are biofeedback, visualization, and drawing. That moment of learning which all of us as teachers have witnessed with our students, can inspire a lifetime of achievement. A young man who sculpted the hand in one of my workshops four years ago wrote me just a few weeks ago about how the experience changed his life. What I really taught him was how to see, and seeing is a transferable skill. He is now doing different work at a different level in a different way as a result of that experience of sculpting. In the application of whole brain approaches to education, we don't teach people how to draw or sculpt as much as we remove the barriers to their ability to see. When this happens, it is as wonderful as Ashley Brillian said: "Inside every little beam of light a rainbow is sleeping." To the individual, that frequently can represent a personal affirmation, which, to me, is a key to learning. That's where my work leads me — affirming people.

No matter what your brain dominance is, the degree of wholeness of your mental process is the degree to which you are situational. I have discovered that even in our secondary areas of mental preference, we can be very expert if we use these modes situationally. So we do not have to have a perfectly balanced profile in order to be whole. That to me is a message of hope.

As I reflect on the many uniquely different people I know and work with, I feel a strong personal need to redefine "normal." I think many haven't felt normal, don't feel normal now, but should feel normal. No matter how different we are, there are normal people like us somewhere in the world. The world is a composite whole brain. There are kindered spirits out there who have mental preferences very similar to ours. As a group, we would be normal to each other. In dealing with the issue of normalcy, we have to be much more inclusive than exclusive. You see, I think creativity is normal. I think being gifted and talented is normal. It's normal for us to have these capabilities. The challenge is for us to find better ways to release them.

As I summarize the brain and learning, I see these kinds of major issues:

1. The brain is specialized.
2. The individual brain is unique.

3. The brain is situational.

4. Learning is mental

That seems so obvious, but we don't behave that way. We do not behave, please understand, fellow teachers and educators, as if learning is mental!

5. Each individual has different learning styles.

6. Learning designs can accommodate individual differences.

7. Delivery of learning can respond to personal uniqueness.

8. Unique people can be made an integral part of the learning design.

As a matter of fact, these unique learners become part of the learning resource because those differences now become part of the way people learn and teach, they teach each other through their differences:

9. Learners can be grouped to make learning more effective.

10. Learning through affirmation and discovery can be more effective, more fulfilling, and last longer.

11. Learning programs that are based on the specialized brains of the unique participants work to the advantage of everyone, including the teacher or trainer.

Responses to learning is independent of age in a whole brain learning design. This is a message of hope. As we grow older, we can look forward to continued learning capability, in essence until our brain becomes dysfunctional.

My experiments with this are very conclusive. In working with individuals ranging in age from eighteen to seventy, I found the learning response absolutely similar. You cannot discern the difference. Issues of age simply drop away when you have the excitement of experiencing a whole brain learning design. After participating in whole brain learning experiences, hundreds of gifted and talented adults (high potentials) have revealed that they now feel normal—no less unique and special, but finally normal and okay about themselves. For some of these people, it is the first time they have felt this way in their adult lives. The understanding of self—the discovering of self—can be greatly facilitated through whole brain approaches to learning. It's never too late for gifts and talents to emerge. Never too late!

Creativity in the Arts

"Laughing, Talking, and Kissing": Darwin, Rorschach, and Poetic Power

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In treatment of the central matter of this Conference, I will try to evoke—without sacrifice of theoretical clarity—a vividly tangible sense of what the creative experience actually is. A powerful poem of William Butler Yeats demonstrates, dramatically, that creativity is not limited to the arts and inventive thought alone. Each of its three stanzas displays one great individual instance of creative action, in a medium different from the others. Both the opening stanza and the concluding one are devoted to celebrated examples: the action of a soldier, Julius Caesar, and of a painter, Michael Angelo: shapers of empire and of images.

The second—and midmost—stanza opens an enormous prospect, of central significance but of greater obscurity in its implications. It pictures a creative agent, a young girl, at a time long before mastery of special gifts can make manifest a particular power. I will read that stanza last.

Long-Legged Fly

That civilization may not sink,
Its great battle lost,
Quiet the dog, tether the pony
To a distant post;
Our master Caesar is in the tent
Where the maps are spread,
His eyes fixed upon nothing,
A hand under his head.
Like a long-legged fly upon the stream
His mind moves upon silence.

That girls at puberty may find
The first Adam in their thought,
Shut the door of the Pope's chapel,
Keep those children out.
There on that scaffolding reclines
Michael Angelo.
With no more sound than the mice make
His hand moves to and fro.
Like a long-legged fly upon the stream
His mind moves upon silence.

These two stanzas develop two crucial ideas that are often overlooked or misconceived and misinterpreted. These are, first, the deep subjectivity of creative impulse, grounded in featureless immensity, and, secondly, the fragility of the mood of widened awareness in which all preconceptions are erased and disempowered.

But the choice exemplification of Yeats' theme is the action of an adolescent girl, only obliquely identified in the poem: the immature girl who in adulthood will become the central figure in the fall of the ancient city of Troy—or Ilium, as the story is told in the Iliad of Homer. Clarity will be served if before reading I cite two famous lines of an Elizabethan drama, The Tragical History of Doctor Faustus, by Christopher Marlowe. They are spoken by Faustus when the diabolic Mephistophilis, servant of the Arch-fiend Lucifer, brings before him the simulacrum of Helen of Troy. Seeing, Faustus cries out in wonder:

Was this the face that launched a thousand ships,
And burnt the topless towers of Ilium? —

The epithet "topless" means here *unequaled*: never outtopped by any other towers on earth.

Now here is Yeats' central stanza, depicting with brilliant effect an apparently trivial action of a girl:

> That the topless towers be burnt
> And men recall that face,
> Move most gently if move you must
> In this lonely place.
> She thinks, part woman, three parts a child,
> That nobody looks; her feet
> Practice a tinker shuffle
> Picked up on a street.
> *Like a long-legged fly upon the stream*
> *Her mind moves upon silence.*

Her musing in speechless indulgence of what may seem only idle transgression of regular deportment, nice behavior of nice girls, betokens the freedom and scope she will bring to ultimate discipline in that womanhood which will turn the heads of the world.

Poetry well made can exhibit—simultaneously with what is denoted—great wealth of implication. But it can do so only if it is voiced with sensitive control of all the sound aflow as speech on the air. In general, sensitive and skilled control of the medium that embodies the products of creative action is prerequisite for their effect: not merely for their successful shaping as they are formed, but for making effectual use of them.

For proof, let us listen to a few characteristic samples of prose and poetry. First an example of a simpler sort, a zestful folk rime in one dialect of slaves in America— as it was spoken before their liberation and for a while after:

> Sinnuh man swingin' on de gate of Hell,
> Sinnuh man swingin' on de gate of Hell!
> De gate clang to—an' down he fell!
> No hidin' place down dah!
> Hallelujah, chillens!
> I went to d' Rock fo' t' hide my face:
> De Rock replied
> No hidin' place!
> No hidin' place down dah!

Any child would feel the dancing art of that poem and the zest of its drama.

Language put to such full use exhibits concretely a disciplined psychic action. For a further, more compact and complicated example, a famous piece of prose: in English translation, "I came, I saw, I conquered," in the original Latin words, "Veni, vidi, vici." That is laconic—and therefore the more vibrant with implication. Julius Caesar, master of words and of the world and of silence, made it. To recognize the degree of his mastery—to feel the force of those few syllables, one must have had some experience of autonomous tongue and eye. The knowledge that empowers must be won.

The reader or speaker of language powerfully formed for our breath must be—as the inventor of it must be—a shaper of language to wholehearted purpose. The reader must order sound and syntax with force and skill—or else he reduces it to rote and rigamarole. So when we read well-made writing, either to ourselves or to others, as for instance to children in a classroom or at home, the test of the text is the same as the test and token of the reader's integrity and intelligence: namely, a full and true rendering of every passage.

Let's take another compelling example: that passage in the first book of John Milton's *Paradise Lost*, in which the huge leader of all the fallen angels cast down by God onto the flaming floor of Hell cries out aloud to them to rise up in revolt:

> He called so loud that all the hollow deep
> Of Hell resounded:—"Princes, Potentates,
> Warriors, the Flower of Heaven—once yours; now lost,

Reading, we hear not only the mere *words* of Satan; we hear the long-drawn noise of their utterance vibrating though all the farthest reaches of the netherworld. Those reverberations augment the power of the archfiend's summons—and make audible the vast enclosure pronouncing in the mockery of long echoes the sentence of endless punishment. Those lines resound with knowledge given directly to the ear, as sheer sound that penetrates our flesh.

We cannot absolve ourselves from the regulations of the real universe. Sane human beings do not with impunity make their way in whim or ignorance: they are continually in commerce with their surroundings. The world is their element, the resource they draw on. The newborn, from the first snuffle and cry as he kicks into the air, is coming to terms with the world: the terms that it imposes and, inso-

far as he can manage, the terms that he can impose on it. If he would constrain the world to serve his need and his desires, he must accord himself with natural realities, he must embrace the world that comprises him, and move in harmony with its almost infinitely complex motions. Or else he will be punished with mortal frustrations.

Creativity in the abstract does not exist. Creativity is our name for that innovative behavior which delivers body and soul from courses of ignorant error, from the treadmills of habit, the stasis of custom, through disclosure of new perspectives and courses of action which fruitfully bring into play psychic energies never before elicited.

My intent in this brief discussion is not to proffer definitions — something I have done elsewhere. It is to show, through concrete examples, that kind of control of a medium which is indispensable for mastery of new vistas of insight and of action consummate in sentient flesh immerged in the flow and flux of a concrete world.

The need for a medium, of sufficient substance and susceptible of exquisite refinement in discriminate use, might be illustrated by various disciplines of insight and expression: mathematics, or painting, for instance. I have chosen poetry for special attention, because of the diversity of its character, as thought and as imagery and sound and kinesthetic and other sensuous substance susceptible of significant ordering in ways appreciable by many. Language is familiar to all of us, here. Poetry is a heightening and concentration of language embodied: consummate in action of very wide and inclusive scope. And as such it can stand — and move — in illustration of life in those moments of fresh intensity that we prize. Charles Darwin, writing of such moments, quotes a young child's explanation of "what was meant by being in good spirits": " 'It is laughing, talking, and kissing.' " Darwin remarks that "It would be difficult to give a truer and more practical definition" of that vital expression of human energies. It is not a mere slack of contentment in quiescence such as might be suggested by the image of a cat curled on a cushion in the sun. It is organic action, in blithe communion. In that vivid state of excitement, as Darwin explains persuasively, "The brain, stimulated by the increased flow of blood, reacts on the mental powers: lively ideas pass more rapidly through the mind, and the affections are warmed."

Poetry by its concentration in rhythmic movement and other sensuous excitations of feeling, images, and ideas can arouse the speaker

and listener to similar activity, equally benign and intense, though deeply and almost wholly subjective. But poetry can do so much only if it is sounded and heard moment by moment, clearly articulated, with exact modulation. Best for illustration of such effects is poetry that evokes the very savor of experience: "simple, sensuous, and passionate." Here is a short poem so central to human passions that it has for centuries moved multitudes:

Western Wind

Western wind, when will thou blow,
The small rain down can rain?
Christ, if my love were in my arms
And I in my bed again!

Saying thus very little, it is possible to say nearly everything. Each reader will speak that poem under stress of his own feeling, and in successive readings may sound it a little differently. But that's because poetry, like love, like the heart in the body, lives only in ceaseless — instant by instant — renewal.

I will read a poem I believe I know how to sound exactly, because I myself shaped it. It draws on experience I had when I was hunting rattlesnakes in Arizona, working for a collector who sold live animals — mainly reptiles — to museums and zoos. We used to pick the snakes up by means of a leather loop we could tighten at the end of a pole — and so drop them into a sack we carried back to the trailer where we stowed them away in cages.

The poem begins with our setting out on the hunt in the cool of the morning when rattlesnakes are abroad:

The Catch

The track of a broad rattler, dragged over dust at dawn, led us
Across the flats of morning under mesquite and paloverdes,
Path direct as hunger, up to a heaped grace of shade
Rodents had riddled into a hill of galleries. There it ended.

We dug into dust to take alive a lord of venom, whole
Rope and writhe as thick as a child's thigh, in halls of his Hell.

But what we found, under a crust crumpling to knives of spades,
Was a path of fury: earth as light and loose as a harrow beds,
Smell of plowland cut and clawed, and darker down in the mound
A sprawling rag of dragon's pearly armor slubbered with mud.

The feasting grave trembled. It shook us. We heard the darkness
 grunt.
A snout full of snarls, of a hound or a hog, heaved the spade up and
 dug under.

But was stopped in its tunneling by the steel, as steel was stopped in
 its teeth. It turned
Quick, clawing and snapping up light, it charged and a choker rolled
 it at pole's end
A badger strap-throttled, flipping like a marlin, battling like a bull on
 a gaff
And snoring anger till over his bravery and scuffling the door of a
 cage clapped.

Burrowing bearclaws rattled in tin. He tasted wire all round.
He bucked, he bruised the ceiling, lunged at a beam and was eating
 oakwood.

But for that ravening he lived unfed and unslaked. His stench was
 immense,
His dung was the curved needle ribs of reptiles. He never slept —
Daylong, nightlong. His furious freedom resounded. At starlit dawn
Jaws and claws rasping and thudding thump of his thunder drummed
 once. Long

Silences rang for him, cage-eater greedy of snakes, abroad in the
 dawn.

  To display and explain all the ways in which in that poem the ele-
ments of flowing sound and sense are organized in adaptation of
their forces to make meaning vivid and exact would require hours of
exposition. Brief and merely suggestive discussion of just one aspect
of the structured substance instrumental in control of motion and
meaning as we read must suffice to intimate the nature and function
of a multitude of others. In "The Catch," the rather long lines, of
seven measures each, are proportioned for various effects required in
depicting objects, actions, and perspectives of more than a little
diversity. The pour of uninterrupted movement in such a long line
unbroken by punctuation allows for flow of statement in a single ca-
dence, slow or swift, level or undulant, variously adaptable for em-
bodiment even of opposite sorts of action, whether of easy advance
in leisured motion, as "Across the flats of morning under mesquite
and paloverdes," or of fast rough scuffle and drag to the clap of a

cage door. The same long line, when broken in its flow by pauses of breath, may hesitate or delay, as in that passage pondering what might be at work below ground: "The feeding grave trembled. It shook us. We heard the darkness grunt." Or the pace may be abrupt, violent, stab of steel stopped in teeth, "Quick, clawing and snapping. . . ."

Noting such obvious facts may remind us that imagination instructed by observation of self and world must guide the rendition of every passage—as it guided its shaping. In a poem well made, nothing is presented for its own sake only. Neglect or distortion of any element, in the reading, impoverishes and reduces the whole.

Near the start of our century—when I was a small child—there was a widespread notion that poetry ought to be recited with lively gestures of hands and arms and bodily posture, with bright glances about the speaker, and with other such flourishes of histrionic ingenuity to enrich and intensify the effect of the mere words. This sort of recitation was miscalled elocution. Its nearest analogue today is the performance of popular music by players and singers bouncing up and down like acrobats riding the bed of a dump truck on a rocky road. Such embellishments are diverting, but if the work being performed is good in its own right, they are as irrelevant as a tapping foot in the aisle during performance of a symphony. When the music is well performed the metronome must be silenced.

A poem may of course require a quietly regular pace of enunciation. I will read in illustration a poem written for a special issue of *Poetry* magazine that was devoted to protesting the continuing war in Vietnam. "This Is Vietnam" is a poem of fourteen lines that I designed to point simultaneously both to its ostensible subject and beyond it. Its specific subject, the overtly offered matter, is the diversity of horrors inflicted by the worst vice of human beings upon the whole race of mankind, a vice easily condemned by people who oppose war while leaving unexplored those causes of deeper origin and more general character from which they would too happily exonerate themselves.

This is Vietnam

Not only death-rattle of armies
Nor the booming, that as yet is at ebb,
Of the tides of fire.

Not only the villages cornered and bumped off like vermin,
The cities pouring like bats out of craters at evening.

Not only the ordure of empire,
Nor the skies that gather to contest it,
Nor the always deepening drone of the hatcheries of power.

Not only the franchise of violence,
The fogs of the streetriots,
Argument by uproar,
Suffrages of rubble,
The ballot of the sniper.

Not only the innocent breath that sleeps through the night.

To leave an argument thus incomplete can incite those who hear to look further—as the dark of an open door may lure speculation out of a well-lighted hall. It will do so the more powerfully if the place already reached and explored has rewarded interest, aroused strong feelings, curiosity or joy or horror. To that end the poetry must not be sounded and heard as if it were some item of trivial substance in last week's newspaper. Whatever the specific subject of a poem may be, the quickening characteristic of "high spirits" is indispensable for its rendering and reception—even of darkest passages.

Darwin's criterion of vitality in subjective life may be compared with the similar criterion that the designer of the Rorschach test characterized simply as "good humor," a designation pointing to evidences of benignly proportioned powers and tendencies, balance and scope and flexibility, in the protocol of the subject examined. Rorschach offered evidence of a different sort than Darwin, but to much the same effect. Their findings converge precisely on a central matter of our responsibility for the children whose welfare is our immediate concern. The "constitutional possibilities for the development of talents," Rorschach warned, do not assure development. Actual development of talent requires an arousal of what "we call instinct, or will, or libido." Power of spirit and mind is inward in origin, it is natural, and spontaneous; but it can be suppressed or mischanneled.

We who are concerned for the growth of the gifted, the talented, the creative child cannot without risk of disaster neglect our responsibility for opening in wide allurement the whole way of access for the child's vital avidities. For they most directly move the child to fulfillment, in the concrete world of substances susceptible of shaping and reshaping in enhancement of life within and round about.

Some activities are spontaneous to the degree that they develop without help. Charles Darwin remarked that ''The art of screaming, . . . from being of service to infants . . .'' becomes ''finely developed from the earliest days.'' But he pointed out that even ''laughing and weeping,'' like talking and kissing, have to be acquired, gradually, through human converse. So it is with the art of speaking poetry, and the art of hearing it. In effect, these two disciplines are reciprocal, best imparted together, and early in the life of the child. Children reared in complete isolation from other human beings never learn even to speak. Real instances prove that.

The few words I have quoted of Darwin, of Rorschach, and of poetry in its motion proclaim against all opposition that our life is *now*. We live in the act of embrace of it, substantial, yet forever new in shape. Children move with the keenest sense of that fact: in the avid present, active, impatient, wanting the best, trying to seize it, unable to wait.

To chasten and curb and halt them may seem necessary: to tame them. But that way prepares them for mediocrity—or worse. Wild animals are in happier luck. The first rule their parents coerce them with is the temptation to live.

At worst we have made poetry an instrument for improvement of memory, or of behavior through punishment, through requiring recall of some passage arbitrarily chosen by a well-meaning disciplinarian—a mass of words to be regurgitated undigested, never to be returned to. But the errors of oversight and neglect can be blighting also.

I think of a child, talented in language, with a gift for imagery, avid for fresh experience, but never offered poetry as moving sound, never helped toward a hearing of poetry—but made only to suffer from it.

The consequence of all this argument is clear. Poetry is a vital resource. Therefore one should manage the medium for life's sake. It should never be treated as if it were mere message, chopped in chunks or ticked off on a metronome. The great Japanese master of haiku, Basho, gave the necessary advice: try it a thousand times on the tongue. Even if the performance is imperfect, we must bring it alive, discover how our own words enfleshed in their running can open perspectives burnished with particular light, quick with meaning in interplay—overt or implicit, suffused with some virtue or virtues as nameless as the fruits of Paradise, as familiar as the sun.

The Saving Grace of Art
In the Education of the
Creatively Gifted

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It is no coincidence that the three authors of this paper bear the last name Barron. The first author met the second author one night, and as she remarked several years later, "And suddenly there were five of us." The third author joined the first two in the early days of their association.

They are joined together in another way that is basic to this authorship, of course. The first author is a professor of psychology and aesthetic education; the second author is a credentialled elementary school teacher in the arts and frequently teaches classes of mentally gifted minors; and the third author is a graduate student in both clinical and cognitive psychology (in the Learning Center at Vanderbilt) and works in the school system with children who have problems of adjustment presumably derived from difficulties in learning.

All three of us have contributed to this article in the ways of our specializations in the general education task announced in our title today: Creative Children in School and the Saving Grace of Art.

The Creative Child

The discontinutiy implied in the terms child and adult is a very real one, but it can receive harmful overemphasis. Actually, almost

all adults who give evidence of creativity in their maturity were also creative as children. Nor are the personal traits associated with creativity in these stages of life very different from one another. Creative people come in all ages, sizes, colors, creeds, and sexes, and within these various categories they display certain resemblances in style and in enduring traits. They are of an independent cast of mind; they are complex in the sense of allowing experience of all sorts into their perceptual system rather than shutting out the discordant or contradictory experience in the interest of short-term simplification; they have intense sensibility, whether of an introverted or extraverted type; they are intuitive. Such traits have been well established in the resarch on highly creative individuals carried out in the 1950's and 1960's at the University of California in Berkeley.

Moreover, and this is very important, scholastic aptitude alone, especially of the sort that leads to conventional academic achievement, plays only a small role in creativity, as voluminous evidence assembled by J.P. Guilford, Calvin W. Taylor, Donald W. MacKinnon, and E. Paul Torrance has shown. This has serious implications for the education of the creatively gifted, as we hope to show.

Art in the Schools

Writing under the the titled, Art in the Service of a Democratic Education, Nancy Barron completed a Master of Arts thesis at the University of California, Santa Cruz in which she interviewed numerous principals, teachers, children, and parents about the role they thought art and creativity should have in the regular school curriculum. In the concluding paragraph in a chapter titled "Conversations with Children," she wrote:

> "The younger the child, the more is art experienced as fun. This in turn is related to actual time devoted to art in the classroom. Art disappears from the classroom by fourth grade in most elementary schools. The younger children delight in art and are not self-critical. Art is still play for them and they have a sense of magic when they create something. Could this be kept alive by continuing art programs with lesson plans that give the children new skills and an interest in more difficult problems? And by making art a part of math, reading, science? These questions need to be answered by educational research and are very important."

One is reminded of Torrance's well-known finding of a decrement in creativity test scores in fourth grade. Could it be that when art goes out the window, so does creativity? Or, worse, does the creativity go underground? And if so, in what form does it surface? Independence of judgment is closely related to nonconformity, and nonconformity can easily become that ogre delinquency. And what role does self-esteem play in the transmogrification of nonconformity and unconventionality into a genuinely compulsive rule-breaking that inevitably locks the individual into combat with the authorities? These questions have the most profound implications for society today.

Case Study of a "Problem" Child

What is a problem child? Try this definition on for size: A problem child is a child who has a problem, is a problem, and is the product of a problem. Very often, a child in a problem situation becomes a problem and is then a problem for self and others. How to break into the cycle of feedback in which the problem situation becomes potentiated in its tendency to create new and worse problems? One way is by individual effort on the part of the school psychologist (counselor, educational consultant, clinician). It means working with both the child and the system or situation, meaning in most cases the school, the teacher, the parents, the child's peers.

As an example convenient to our present collaboration, we present now a report of a single case by a psychologist (our third author) working in a school system in Nashville, Tennessee. Her defined role in this situation was that of a clinical trainee with competence in cognitive psychology and learning disabilities.

The Case of Christopher (as reported by Brigid Barron)

"I came into contact with Christopher because he was referred for assessment of eligibility for certification of a learning disability. The referral originated with a psychologist in private practice (Dr. Towne). Christopher (an eight-year-old white male) is currently repeating the second grade in public school. He is living with his mother but spends three days a week at the home of his grandparents.

"Christopher's mother was 16 years old when he was born. Because she was unable to care for Christopher, she gave him to her parents to take care of. For two years he lived with his grandparents

and they in turn sent him to live with his great-grandparents. (This might be called a four-generation problem!). The great-grandfather is described as a man of a very violent temper who quite often behaved in an ugly, abusive fashion both to his own wife and to his daughter (the grandmother), as well as to Christopher. When Christopher was five, the great-grandfather slipped on one of Christopher's toys and broke his collarbone, and in his rage he threw all the toys into the trash can and slashed the offending toy (a ball) with his knife. This was but one of many incidents in which the great-grandfather behaved abusively.

"When Christopher was six, his great-grandfather became quite ill with cancer, of which he was soon to die, and Christopher was sent back to live with his grandparents. He saw his own mother about once a month. Christopher was brought to Dr. Towne by his grandparents, who were concerned about both his poor school performance and his behavior at home. He was having frequent temper tantrums, in which he would make growling noises, tear curtains off the walls, etc., etc. He was also quite fearful and refused to go anywhere in the house by himself. In school, he had failed the second grade (he was age seven-and-one-half at that time).

"Dr. Towne did a complete evaluation, including a WISC-R, with Christopher, and recommended individual therapy. She made it a condition of her beginning therapy, however, that the grandparents must adopt Christopher legally. But Christopher's behavior grew really bad about this time, and the grandparents, who had in fact planned to adopt Christopher just as the therapist had insisted, changed their minds. So therapy was never begun, and Dr. Towne, who had observed some distractibility on the WISC-R as well as a significantly lower Performance IQ than Verbal IQ (which could interfere with school performance) requested evaluation by the school. (Christopher's Verbal IQ was 140, his Performance IQ 115, with an overall IQ of 131, on the WISC-R). I was asked by my practicum supervisor, Mr. Careful, to interview Christopher and to administer an achievement test to determine eligibility for certification of a learning disability. It should be added that his second-grade teacher had described him on a checklist as "resenting authority, talking back, having trouble concentrating, undergoing sudden changes in mood, having problems with memory, being in conflict with his peers, and being nervous."

Being nervous! And no wonder, the reader may be forgiven for

exclaiming! Things were certainly looking bad for Christopher. Now comes the good news, however. Brigid's report continues:

"On my administration of the recommended achievement test (the Woodcock-Johnson) Christopher scored at the 23rd percentile in Reading. This in conjunction with the IQ discrepancies, meant the criteria for certification of a learning disability. However, I didn't feel good about sending these results forward without more assessment, as I myself could not see any particular learning disability. Christopher was extremely cooperative, put out lots of effort, didn't have problems concentrating, showed a lot of normal curiosity, and was eager to get to harder problems. Although his Reading score was low, he did not seem to have difficulty in perceiving or distinguishing letters. I talked to Mr. Careful and we decided to continue the assessment. I did this by asking Christopher to draw pictures, make up stories, write little poems, and play games like "Three Wishes." Examples of the verbal assessment products are given below:

1. Poems and stories

I don't know why the sky is as blue as the sea.
I don't know why the sun is yellow.
I don't know why my country is called America.
And I don't know why ice is cold.
But I do know you. (1/20/88)

Why does the world look up to me?
Why, why I say.
The world crumbles on me.
I'm history. (1/27/88)

It was mine and now it's his.
My life leaned against it.
I made a fool. (1/27/88)

I stand on a mountain.
China Sings to me. (1/27/88)

My tree itself died in the death of winter.
It grew back in warm summer.
My heartbroken was no more heartbroken. (1/27/88)

I seem to be far off but really I'm very close
I seem to be a cherry but really I'm a rock. (2/3/88)

My hair is made out of worms.
I chew a bone every day.
I eat rats for supper.
I play with chewing gum that I see on the street. (2/3/88)

The above was accompanied by a picture of a boy with his foot stuck in chewing gum about to be stepped on by a large boot.

Bubble Pipe
One day I was blowing bubbles in my favorite oak tree.
I saw something in the bubbles, I got closer. It was my dreams.
I got sleepy, I fell asleep. I dreamed I was in Labyrynth.
It was very weird. (2/17/88)

Noises in the Tree House
One day I was climbing up to my tree house.
Before I got to the top of the tree house I heard some giggling.
I climbed the whole way up.
Every time I turned the giggling would stop.
I got closer, I saw a troll.
I jumped down.
I found myself in bed.
Everywhere I look I see you.
I'm in the woods I see you.
I'm in the mountains I see you.
I'm in the pits I see you.
What am I seeing?
I'm seeing the earth. (3/2/88)

2. Three Wishes (What would you wish for if you had just three wishes and you were sure you would get what you wished for?)
Christopher's wishes:
That my family and friends would never die.
That we had lots of money and we could survive.
To have all of my friends forever and to keep having wishes.

"At this point, I became much less worried about Christopher! These responses took place over several sessions, during which Christopher took to this new sort of schooling with increasing enthusiasum and delight."
Psychodynamics aside . . . and of course there is much room here for psychodynamic formulations (emphasis on the simple rather than

psychodynamic) . . . what Christopher is showing us is a lively imagination, a very original use of language (and not just for an eight-year-old but for anyone), and strong sense of self, albeit a troubled self. In clinical prognostic terms, he has a lot of underlying ego-strength. He is a creative child, gifted in the use of language, poetic in his perceptions. And, of course, in grave trouble. Yet the trouble he is in is proportionate, it seems, to the hard times he has had in life: fatherless, almost motherless, rejected, abused, beset by fears, deprived of the opportunity to establish easy controls for himself (rules to go by, without fear or conflict) in a normal family setting. He is certainly certifiable as something . . . but not as a learning disability! Where is there a place for the Christophers of this world? Who can help them?

Without claiming too much, we can say that the schools's response in the case was ultimately very helpful. Here is the final paragraph of Brigid Barron's report, written near the end of the school term after several months of weekly meetings with Christopher and consultations with her supervisor.

"I worked with Chris the remainder of the year. His grades have gone up to B's (maintained now through two report cards). He still has trouble with distractibility in class but his behavior has improved and he is no longer considered a problem for the teacher. I did some further testing with him for intellectual abilities near the end of the term and we were able to certify him as gifted in the area of mathematics."

And a further note a month later:

"Christopher's 'gifted' teacher loves him! And at the end of the school year he took still another set of tests in which he scored at the top stanine in mathematics, and well above average in reading!"

The gifted who are lost to themselves and society are tragically many. Alertness to the potential for giftedness, and resourcefulness on the part of the school system in finding ways to nurture it when circumstances threaten to extinguish it, are themselves expressions of creativeness in education. Among the ways, let us say once again for emphasis, is the opportunity to take part in activities in art, whether through pictures, or words, or guided imaginative play, or in the realm of numbers and natural science.

After all, without art what are we?

Creativity In Music

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The sounds of nature have always impressed and affected me. Being very sensitive to these sounds around me led to my composing songs as a young person in rural Utah. I used my untrained but natural talents to do so. I remember that as a child, I played for adults one of the tunes I had composed on a violin which I had built for myself. Much later, after I had obtained formal training in musical composition, I checked back and discovered that in my earliest works I had been "in tune" naturally with the known principles of composition. In that way I learned that my earliest musical compositions had been createtd properly.

I especially drew upon these sounds of nature in my famous Trilogy. I submitted my Trilogy anonymously (using the pen name of *Nostrebor*, my name spelled backwards) to the large international competition for serious compositions and won the Reichold award of $25,000; the largest cash award ever won by a composer at that time (and perhaps ever since considering the current dollar value of that award). I don't mind mentioning that it was this dollar sign, not my Trilogy and other music, which eventually caught the attention of many Americans and convinced them that I was a top composer.

Eventually, and perhaps initially and naturally, my thinking was in the form of music. Music in my mind was the primary nature of my earlier pre-expressional stages of thought, not merely a case of music entering in only during the expressional processes in the later thinking stages. Consequently, I feel that I have had minimal translational problems in going from my thinking processes to my musical expressions and compositions. More than once during discussions I have stated that music was "often running through my head, as it is doing now." I remember that one of the discussants quickly countered, saying "tunes often run through my head, too." Then he added, "but the big difference between you and me is that mine are only old tunes, not new ones as you hear in your head."

When asked if the melody in my head is ever in words or are words ever involved or attached at all, I replied, "No, but there are times when one gets a beautiful wedding of the two such as the combination of the words and music when I composed the music for the Book of Mormon Oratorio. As soon as the words were ready, the music was there. I didn't have to worry about the music at all."

Is education giving due heed and attention to those students whose most "natural type of pre-expressional thinking" is nonverbal like mine? Or are there many other possible types of nonverbal pre-expressional thinking?

Once I had a feeling of tremendous illumination just for a moment or two. I thought if I could just get this down in some artistic medium, I could later try to polish and elaborate everything when there were moments for reflection. People seize upon these illuminations and then try to give them some duration because the fleeting, first impulse can never be given to an audience, only by itself, for it would be too short. In school, students must be allowed to have certain periods of illumination and then reflection in order to deal with these type of things.

My opinion is that only an artist would be an *ideal* teacher of his type of art. I could not think of a more ideal type of teacher of an art. Therefore I like teaching that way myself—by creating right from the start. There's no reason why teachers shouldn't. But somehow—I can't get away from the fact that we must do this under a certain type of discipline.

Regarding techniques, I feel one must have mastery of his craft. Improvisation is the last thing we do. In a mastery class, Casals, the

great Spanish cellist, stated that improvisation, playing a cadenza, required the greatest control, the greatest knowledge, the greatest discipline, because there you are free. There you need the greatest precision, the finest type of measurement, and premeditated measurement, and not merely just how you feel.

I gave my impressions of works that had been produced by persons who lacked knowledge and mastery of the disciplines and techniques of their field of art. These persons claimed that it was much better to go ahead without any inhibitions, just to project whatever was effective emotionally without any reference. One of them said that he did this piece of work just for himself. Some said, "That's the way it should be; form is an old fashioned word. It must be absolutely free." To me, it was chaotic.

Memorable Creative Teaching Experiences

One characteristic of an ideal teacher is to think and perform creatively in the classroom and thus stimulate surprise and curiosity. My first teaching experience began in the middle of a school year. I was to teach music to a large group of rowdy students who had just driven out the latest in a series of teachers. I first went into that class in late autumn and the students were deliberately noisy, away from their desks with some at the windows. I noted that there were no songbooks and practically no other teaching facilities except a piano and a chalkboard.

When faced with this dilemma, I remember that I reacted by going to the piano. I struck a loud chord, which caught their attention through surprise, and I asked loudly and promptly, "What did I just do? Who can write it on the chalkboard?" Through a series of attempts, the students finally wrote the chord accurately. Then I struck another chord which they added to the first one on the chalkboard. Soon "we" had composed a full line of music which they continued to record on the board. Next I had them sing it. By then they had forgotten their troublemaking and the disciplinary problem had vanished through my continuously using this type of creative teaching.

Later, in the year I helped them compose a new school song, which they proudly sang at halftime during a basketball game. This surprised their opponents for it replaced the usual rowdy behavior between the schools at the halftime break. I later handled the three

toughest boys by having them help me compose a special song dedicated to their farm animals and they thereby became my lifelong buddies. Through these unexpected but appropriate approaches, I stimulated and retained their curiosity and interest. I have wondered whether many other teachers do this often in their classes.

Other Thoughts on Creative Processes and Products

Music offers many opportunities for a person to become creative—not only for the composer but for the performing artist as well. A gifted artist will interpret a standard composition in such a way that the work takes on a rich, new meaning. A conductor who responds to the message of an important score will lead his musicians in such a way that their playing is authoritative, yet vital, fresh and exciting. *Creation, or at least re-creation*, is occurring constantly in the performance of both old and new works.

Often, creativity in music is a shared experience. A composer will add his talents to those of a poet in writing a song, or it may be the other way about. In the creation of operas, ballets, musical comedies, and other dramatic works, several people may be involved. One may write the story, another the dialogue, and someone else the lyrics. One composer may write the tunes, which are harmonized and arranged by another, and a third one may orchestrate the production. However, when one speaks of creativity in music, it is generally felt that this refers to the construction of a composition by someone with talent and ability.

"A composer should compose just the right amount—not too much and not too little." This is one of my frequent statements which *builds a wholesome linkage between the creative arts and the performing arts*. The composer should create enough structure for the performing artists to be able to grasp and use. However, he must not create too much structure or else he will limit severely how much creativeness, involvement, and other personal style and characteristics that the performing artists can put into it to produce a creative, rather than a mechanical performance with an optimum degree of structure. The resultant can be to have a masterpiece effect upon the audience.

A striking feature of a masterpiece is that it tends to be self preserving, self perpetuating, and self propelling. In other words, its impact on at least a few key people is that they want to preserve it for

themselves so that they can repeatedly re-experience its effects. They also want others elsewhere and at other times to be enriched through sensing and experiencing the masterpiece.

There are strong relations between mathematics and music. Techniques exist for reducing a musical composition into a one page graphical (geometric) representation which can then be analyzed to tell whether it is a masterpiece or if it lacks having all the necessary characteristics, in what aspects did it fall short of attaining such status. Composers can and many do use "mathematical" techniques in their composing. They can check back on their product by geometrical analysis methods to determine its weak points and to revise their composing so that it may attain a higher level in all respects. I have used these graphical techniques in my composing as soon as I became acquainted with them. This could become a fascinating area for experts in measurement research. Researchers can learn a great deal to gain vital insights into this criterion measurement approach to musical compositions. Such finding could perhaps also lead toward being generalizable to other arts and even to other high-level human products and performances. Regretfully, this has generally not yet been done by experts in constructing new measures and approaches.

There is a great need to emphasize the importance of reproducing, publishing, and publicizing a masterpiece, thus helping it and its creator become more rapidly renowned. One reason why the musial works of the Russians are widely known and accepted is that the Russians have done so by most effectively publishing their composers' works.

In about 80 A.D., the famous Greek critic, Longinus, stated the following: "What is rightly great will bear close examination, attract us with an irresistible fascination, and imprint itself deeply in our memories. Consider a work fully and genuinely excellent only when it pleases all types of men in all ages. When men of different occupations, habits, ideals, and ages all agree that a work is excellent, such a unanimity of opinion on the part of diverse critics secures strong and unshakable confidence in the object they admire." Any musical composition is assured of an enduring life if it fulfills the foregoing requirement by Longinus given in his "On the Sublime" (Gilbert, 1940).

Though some composers and musicians feel otherwise, I am very impressed with the great variety of types of music including popular types and the great quantity of production of popular songs each

year. To me, the amount of music in different forms being played on new and continually improved equipment that are sold in vast numbers nowadays is truly amazing.

Repeatedly, I have told people of my great concern about the remarkable folk and other kinds of music that has emerged from almost each and every island group throughout the world. I fear that these gems in music may be on the move toward becoming "endangered species." Somehow, and in various forms, all of these music pieces and instruments emerging from different types of islands and from different isolated groups on the continents should be captured and logged into at least a few if not many libraries around the world. In that way, they will not get lost through being recorded for all generations to enjoy and to use as springboards in creating further music of that type. Or they may be combined with other types to create whole new combinations of music types never yet composed and appreciated.

In 1965 with Calvin Taylor, I became a co-founder and trustee of the *I*nstitute for *B*ehavioral *R*esearch in *C*reativity (IBRIC). Then I awakened more fully to the importance of creativity to all people. After this discovery, I gradually realized that I had three major missions in life, namely, (1) my continuing to sustain my own composing at a high level, which was always my first professional priority; (2) my functioning as chairman of the LDS Church Music Committee (10 of my songs are in one of the book of Hymns in my church); and (3) my telling others and wanting to tell the world about the *importance of creativity in all fields* and to help all people discover and turn on their own potential creativeness.

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Having Children Explore Creativity Through Dance

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I have always had a deep respect for childhood. Early in my professional studies I realized that, in the name of dance, much damage was being done to young bodies and false values were being fostered in immature minds. The child was being denied the true beauty of youth. Through dance as an art form, I gradually learned to teach many basic truths to the child and in doing so developed a philosophy that has grown to be one of my most treasured possessions.

During the past few years a great deal of time, thought, investigation, and study has been expended throughout the world to try to find ways to measure and discover more about this elusive quality called creativity. Martha Graham, a great choreographer and teacher, maintains that "All of us are born with genius, but some only keep it a few seconds." I have always realized that *there is creative energy in all human beings*. Our particular purpose as teachers is to open avenues that will encourage children to question, to investigate, to solve problems in more than one way, and to attack problems at hand with zest, which encourages us to go beyond that which is easy. This is a teacher's responsibility.

Teaching for creativity starts with imagination and ideas. Most children are filled with both, especially ideas . . . ideas that they are eager to express, *ideas that they must express if they are to live fully as children, then as adults.* To a child anything seems possible. His world is filled with fantasy, which is frequently dimmed when we, as parents, teachers and friends turn down the lights in the child's treasure house of imagination. There is none more quick than the child to realize whether or not you offer sincere warmth, understanding, and interest. *Only when rapport is established will he unlock the many doors of his heart and allow you to share your treasures with him — and his with you.*

The key to guiding the child to self-fulfillment lies in taking those moments which involve thinking and feeling and exploring creative experiences. When one has the true interest of the child at heart, there is a constant search to open new channels which will increase his awareness of the world and give deeper meaning to his everyday life.

One day a beautiful five-year-old greeted me with a special sparkle in her eyes. "Miss Virginia, I discovered the 'backwards going skip' and I'll teach it to you". What joy there was in that moment when we went skipping backwards together! Now you may think this was a very simple thing, but let up pause for a moment and ponder its true worth. For this child the discovery that she had the co-ordination to skip backwards was a new moment; nothing just like it had ever happened in her life.

I could have said, "Oh, everybody can skip backwards", and the spark that could ignite further discovery might have been crushed. Part of the richness of adult-child relationships is developed by the adult's ability to see through the eyes of a child.

The creative force must not be permitted to waste itself. It must be directed, given time to develop, given stimulation, but in its growth there must be a creative person to guide it. Working imaginatively with people does not mean "today we will listen to this music and follow whatever it suggests. "Take these paints and paper to draw anything we want." Take this set of blocks to build whatever comes to mind. "Many people misconstrue the word "creativity". To be free to think, to see, to explore, to fully use one's imagination requires great discipline, order and organization, plus habit. There must be constant urging of the mind and body to reach out in new di-

rections, to find more than one way to solve a problem so that within the structure of each venture undertaken, a child will search for knowledge, understanding, and truth with persistence.

A first grade class was given an opportunity for a delightful creative experience. Each was to select a leaf that seemed to have a particularly pleasing shape. One little boy was curious about the many shapes he found in leaves and encouraged his family to go with him on a walk to help him find just exactly the leaf he was looking for. How delighted he was to find a large oak leaf that seemed to have a special coloring, a real perfection in his eyes. Proudly he took his leaf to school and entered into the project enthusiastically. The children were to use the leaf as the body of an imaginary child and add a head, two arms, and two legs. What fun they had. The one little boy took a longer time to finish his child than was allotted, and when the teacher came to investigate why he was taking so long, she discovered that he had added a cap in one hand and an umbrella in the other hand — "Just in case it rained".

With a pair of scissors in hand she quickly picked up his paper and clipped off the added cap and umbrella. Needless to say it took weeks before this same child dared to investigate, for he was embarrassed in front of his classmates and his teacher had disapproved, thus killing his enthusiasm for some time.

I shall never forget the day a seven year old came to class with a troubled look on her face. "My tooth, it keeps pushing and pushing and it hurts all the time." The question flashed in my mind: "Could I help this child understand, through dance, this very puzzling incident?" The class gathered for a discussion about seeds as they burst through their jackets, chickens as they hatch, and a pupa as it emerges from the cocoon. With this key idea as the focal point, we curled up as small as we could to discover many ways to push with our shoulders, with our feet, with our backs, with our heads, until finally we broke through a make-believe-barrier. Then our bodies began to stretch and open up as fully as possible, our minds and bodies understanding the tremendous principle of growth.

Ideas give us wings. The idea is the hinge upon which dance swings, and it is the idea that dictates the movement patterns chosen. So many times a song, a poem, a story, a trip, and even a problem in arithmetic can have so much more meaning when understood through movement.

There is a great deal of truth to the statement, "All God's Chillin's Got Wings," but far too often those wings are clipped by us, as

adults, before they have known the joy of soaring. Children need beauty in their lives. They need to be excited about the discovery of a fresh way to hear sounds, to see, to think. I try to guide children to discover their own potential in movement by encouraging them to go beyond that which is easy; by enhancing their awareness and knowledge of the tremendous power of rhythm; by discovering the joy of clean line in movement; by helping them to move with ease and agility, balance and control; and by encouraging them to compose patterns based on the principles of composition.

Tapping creativity through structured exploration and improvisation, children have found beauty, beauty that comes from believing in Self. As these experiences take place, a child is spreading his roots in fertile soil while his wings are beginning to grow.[1]

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1. Editors note: Viktor Lowenfeld, a tremendous consultant and world leader in art education, repeatedly stated that he never believed or felt that he was just teaching creativity *in* the arts but that he was always teaching creativity *through* the arts. Virginia Tanner has also said the same thing many times that she was not teaching creativity *in* dance but that she was teaching creativity *through* dance.

Flight of the Imagination
Dance and Creative Element

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By its very nature the creative in dance emerges through the Kinaesthetic; from the essence of our imaginative working through the whole consciousness of mind and soul;

The choreographer shapes the material using images that are pushed to the surface from the unconscious by the intuitive process of the life of the imagination; ideas are transformed into revelations or visions, very different from the first glimmers of inspiration;

The creative artists brings into being something that has not previously existed; demanding the commitment of intense labor; the creative effort being the result of response to an inner need; for many the act of creation has a deep emotional base and an equally deep spiritual felt experience.

The creator in dance speaks through the creative consciousness to others; the ideas becoming visible through the forms of movement—the living motion—the instrument, the human body, needs to be sensitive, responsive to interpret the meaning and expressions that are to be communicated with skill and understanding—expressive material; the gifted in dance develop this kinetic sense—awareness of the body and its parts—in movement—bones, muscles, nerves, breath—the framework of the body structure for

communicating through the physicality of the dance; self-discipline in achieving technical skills through a special training in the vocabulary of the dance; experiencing the sensation of power as the muscles prepare the body for the flight of elevation—of leaping, jumping; central through the poise of the body in balance; within the capacity of human movement one learns flexibility, coordination, control, for the rhythmic responses, movement elaboration and dynamic range;

The gifted and talented who experience the learning and knowing of body movement trust and understand its forms of expression, depth of communicative power; the gifted youngster in dance is able to identify through the response of the instrument, the body; the levels and sensations of rhythm, design, gesture and dynamics;

Through the discipline and freedom of the learning processes in dance one develops a heightened awareness to the rich, fluent and varied language of movement—its capacities—myriads of potential movements;

With long leaps of the imagination the gifted and talented need outlets for the transcendence of the ordinary self—to seek originality, invention, generating a response to the world in which they live; transmitting their inner creative energies into a new outer reality;

Gifted and talented children in dance need to release the creative imagination, translating their perceptions into movement images;

They need outlets for a personal affirmation of their physical, intellectual, emotional, spiritual and creative faculties; constructive expressiveness; the expansion of the personality.

Through music, aesthetic sensitivities are enlivened; the relationship of dance creativity to poetry, drama, painting, nature and the environment, flow into increased awareness . . . the stretching of the creative potential.

Opportunity is needed to realize this potential; the superior abilities and highly developed level of interest in creativity must never be stifled. There needs to be a stimulating programme that challenges creative talent allowing the imagination scope to discover, invent, explore in a conducive atmosphere; the imagination determines how effectively we can use our creative gifts; not only the mind but the spiritual values of the soul, guiding using a constructive way rather than in a negative approach.

Those who engage in the creative experience need careful nurturing allowing them to explore and experiment with confidence, self-esteem; a stream of consciousness that leads a gifted and talented stu-

dent into what D.H. Lawrence described as 'a kindled state of consciousness'.

The young are not less capable of expressing ideas of enlivening and perceptive interests than adults — they have an enormous capacity to question, to express viewpoints, to wonder. . . .

They need teachers who will draw out their creative expression, stimulating curiosity, originality, spontaneity, flexibility in working creatively; promoting innovative aliveness for an interaction with others, a communication to those around us.

The gifted individual needs a gifted teacher; involving the child to coordinate their physical ability with images, movement, patterns of space and time; improvisational discoveries.

Create the opportunity for the child to use their own ideas through imaginative endeavour — a direct expression through individual or group expression through dance movement; infuse the material with a new twist so that new ways of creative action can be discovered.

Gifted teachers allow the child to use the essence of imagination to the fullest extent — to be discriminating and selective in the quality of work, a critical perception and evaluation of the product.

By skillful sensitive direction children must be encouraged to create and exhibit their own artistic dance works; discovering in themselves creative resources; a spirit of inquiry and a free flow of imaginative ideas; space and time to expand, to be free from pressure to conform to the stereotype. Not imitative — but a genuine sensitive attempt to present their own insights and experience.

What is needed is excellence in the teaching of dance to gifted children, recognition and development of their abilities and opportunities to develop at a faster rate.

Each creative experience is an added dimension in discovery . . . resources that one was not aware of — in oneself; . . . of saving creative ability . . . of acknowledging the creative potential . . . of developing a perspective through imagination that allows us 'to see' in a new way . . . ourselves and others.

. . . to become a creatively educated individual interested in the creative process, the creative spirit

. . . resolving ideas through dance and its creative element.

My program was concerned with the understanding and exploration of movement through creativity in dance;

The theme of my presentation was 'Flight of the Imagination'—focusing on the aim of the Conference—'Expanding Awareness of Creative Potentials' —

The process is a flexible one concerned with the body, the strongest and at the same time the most fragile of instruments; and the workings of the imagination. To find ways through an expressive kinetic vocabulary which brings fresh, original meaning to content so that it says something to us.

My dancers were from the Children's Dance Theatre from the Virginia Tanner Theatre School of Creative Dance affiliated with the University of Utah—about twenty young dancers aged between ten and eighteen years participated.

Their years of dance study provided me with a group of creatively aware individuals, technically skilled in the modern dance—sensitive to improvisation, invention and creativity, reaching into their subconscious for imaginative ways of moving the body . . . unusual answers to my need to unfold by creative material from my imagination—all translated through the medium of dance—The dancers were so responsive that I was able to draw out from them movement possibilities that were both creative and kinetically intelligent—

By my methods and approaches to the creativity of the dancer I could release individual and group reactions, awareness, expanding their creative potential . . . thus sensitizing the imagination . . . they had the courage to invent.

Spatial designs; improvisational themes; the use of props; the developing and performing of my creative compositions, 'Floss' and 'Mangrove' gave full scope and realization to their creative power.

Nurturing Creative Potentials: A Model Early Childhood Program

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The early childhood environment is one setting where the creative and cognitive potential of children can be nurtured. Rather than implementing traditional methods of teaching such as worksheets and drills, early childhood educators should focus on how children learn as a guide in developing appropriate curricula (Kamii, 1985). At the Child and Family Development Center at the University of Utah, an early childhood curriculum based on creative thinking skills has been developed. Our main emphasis in the program is that children in their formative preschool years are creative and talented young people with great potential. It is our philosophy that with a supportive environment children can develop skills in areas in which they show potential. Without stimulation of the physical and social environments even a child's biologically based abilities are unlikely to develop (Albert, 1980). Creative expression at later stages in the life cycle can often be dependent on early success in creative endeavors (Torrance, 1962). Nurturing environments are essential in the development of creative potential. This is an overview of the physical and social components of our model program which was developed to embrace these views of the environment.

Consistent with the ecological framework of interacting environments (Wright & Herrin, 1987), we provide children with creative learning experiences in a physical environment tailored to the needs of young potentially talented children. The center emphasizes the creative ability inherent in all children. The basic premise of the program is that each child is creative and talented in some area. The objective of the program is to explore the areas in which a child displays ability. This goal is achieved by providing young children with creative learning experiences in a variety of talent areas. This multiple talent model is based on Howard Gardner's (1983) theory of multiple intelligences. Gardner identified seven areas of intelligence each with its own unique dimensions. The seven domains of creative ability in our program that parallel his theory are: language ability, musical-rhythmic ability, intellectual ability, spacial and design ability, body coordination ability, artistic ability, and personal leadership ability.

Creative experiences are designed in each of these areas to facilitate the development of ability in these domains. Children have opportunities to participate in activities in these seven areas of creative talent on a daily basis. Most of the classroom experiences center on free choice activities where the focus is on promoting the child's independence and curiosity. At other times the children are involved in group experiences to reinforce the concepts emphasized during the day. For example, one day in the Center when our curriculum focus was insects children were involved in various activities such as observing insects they brought for an "insect zoo," learning about osmosis while creating butterfly wings with absorbent paper and colored water, writing insect stories, acting out "The Very Hungry Caterpillar," classifying insects, and during group time emerging from paper cocoons. Children in our environment learn through discovery rather than passive participation.

Unlike many "gifted" programs where the focus is on developing cognitive skills (i.e., reading, math), in our view children with other abilities are equally as talented. The artistically talented child is viewed as being just as "gifted" as the child with exceptional math ability. This is one way we have attempted to overcome a strong cultural bias that intellectual skills are superior to other types of abilities (Albert, 1980).

Inherent in this perspective is the importance of creative thinking. According to Gardner (1983) being creative in any of the intelligence

areas is the highest level of functioning. Consistent with this orienta-
tion, we use creative thinking activities throughout the curriculum to
cultivate areas of creative talent. For example, in enhancing music
awareness, children might be engaged in an activity where they illus-
trate the rhythm in their names. This exercise in creative thinking
helps them become more attuned to the rhythm and sounds in daily
language.

Many people limit their view of creativity to an artistic product
but creativity is really a way of thinking. Creativity can be simply
defined as the ability to perceive situations or problems from new
and different perspectives. Creativity is not a rare or unique ability
attributed to a few but is an ability we all possess that can be devel-
oped (Torrance, 1962). The following components of creativity (e.g.,
Guilford, 1977) are integral parts to our curriculum: fluency - to pro-
duce numerous ideas, flexibility - to come up with variations on a fa-
miliar idea, elaboration - to expand on ideas, sensitivity - to sense
problems and solutions, originality - to create unique responses. In
our program daily activities based on these components are designed
to expand children's thinking abilities.

Although many of the creative thinking exercises expand
children's imaginations, a large part of the curriculum is devoted to
problem solving situations (sensitivity). Given our rapidly changing
environment in terms of technical and social changes, we feel that
creative problem solving is not a "frill" in the curriculum but an im-
portant survival skill (Toffler, 1980).

Because we believe that children are intrinsically motivated to
learn, another critical component in our early childhood environ-
ment is trust in the learner (Montessori, 1964; Piaget, 1972). Children
in our program make choices about their learning. An appropriate
environment for young children is one in which they are allowed to
make decisions (Kamii, 1985). Children are engaged in "free choice"
activities for the largest percentage of time in our program. Often an
environment such as the one in our Center, where children are ac-
tively making choices, is misinterpreted as one in which children are
"just playing." Unfortunately, many adults have to be convinced
that learning can be fun and that children can learn through play. We
view play as a nonthreatening, non-competitive, and a vital teaching
tool in the curriculum. Play provides children with an opportunity to
explore their world in a very natural way. Children's active explora-
tion in self-directed play forms the basis of our curriculum. Children

are enthusiastic about their learning when things are of interest and personally meaningful to them (Piaget, 1972).

Finally, a major key in this model program is the involvement of the family in the development of their child's creative ability (Bloom, 1985). To achieve our program objectives a strong home-school relationship is essential (Moore, 1982; Wright, 1987). We believe the effects of our program will be short term if the nurturing of creative abilities is limited to our early childhood program. Parents need to take a special interest and have a commitment to develop their child's abilities and talents for long term effects (Albert, 1980; Bloom, 1985). Families are the catalyst and the cornerstones in this creative program. They need to encourage originality and exploration at home.

In conclusion, research indicates that creativity peaks during the preschool years (Torrance, 1963) and that creative abilities not nurtured during this time can become more difficult to express later. As Taylor (1984) emphasizes schools are too often concerned with the development of a few cognitive skills (i.e., reading, writing) often at the expense of other areas of development (i.e., music, art). Children possess many talents and abilities that represent a rich source of human potential. When educational experiences of children do not focus on nurturing these abilities, society loses an important resource. Programs with an emphasis on creative thinking and talent development, are essential for the future. We have no idea what the twenty-first century is going to hold for our children; creative abilities may be the key to adapting to the future and all the changes that it will bring.

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Integration of Aesthetic-artistic Education

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The title of my lecture could be the following: I'm going to speak about an educational experiment. The key problem is the very same both in practice and pedagogical research: If talent exists, why isn't there any (I mean at schools). And if it doesn't exist, why does it nevertheless work? What is the integration good for? What is the role of language and history in the integrative model?

In our country it is a serious problem in the "uniform school system" the same content isn't integrated into a unit. Our subjects are totally separated and not connected to each other. It is very harmful. It is a barrier and not a benefit for talent. There are three kinds of "medicine" that could cure this illness of schools: Modernization, self-direction of communities and *integration*.

I don't think that the solution is a "deschooling society." Quite the opposite: it is rather socializing schools that is needed, which uses talent, not for discrimination, but for everyone's improvement. By our term this is the *basic reform*. Heaping up desperating information is not what is needed. *First the abilities should be improved so that talent could work. This is a new, integrative educational model.*

A new Thomas Jefferson would also be necessary so that the "Declaration of Independence of Nowadays Education" could be born. It should be declared that talent is an imminent, independent

value that can't depend on daily political interests, societal advantages, disadvantages, can't serve egoistic aims, only the *inherent essence of mankind: the love.*

In Hungarian, the word "education" has a precise meaning. Etymologically it derives from the word *growing* or *to make something grow.* A child gets a good education if his abilities (talent) proportionally grow. Growth can't be acquired by the autocrat violence of old-style schools. It isn't a command that makes the grain of wheat grow. It is the genetic program, and on the other hand, it is the good gardener who ensures watering, good soil and sunshine. *That's why life grows.* (In old Hungarian language the "wheat" was called "life.")

In the teleology of education the cause of growth is the talent. (As a genetic program, as a possibility, ability.) Its conditions are the facilitating human community and transferring love. Its purpose is *cognition* and a more and more perfect level of it. In French the word for "cognition" (connaissance) consists of two parts. If we literally translate it, it means *"co-birth."* That's the primary condition of cognition. Co-birth is nearly the same as that of education "biocenocis" (life community). In a real community there is no unfair differentiation. In real education, talent can't be the colonizer of spirit and can't be a cause for segregation. Geniuses exist, but neither of them can be an aristocrat, colonist with privileges. We agree with Irving Taylor, who stated that a basic level of creative ability is innate in each person. The Hungarian composer, Zoltan Kodaly stated that "there is no tone-deaf child." He supposed that *everybody* has musical talent. (Of course there are several types.) Talent means the *sensitivity of observation* besides ability and capacity. And it can be taught and developed. That's why we can't accept that there are "untalented" persons.

When considering the question of talent, the problem of value and evaluation can't be avoided. According to Bela Bartok, a beautiful folk-song can have the same value as a symphony of Mozart. What follows from it? The fact that talent is relative and absolute at the same time. Its vital condition is democracy of evaluation.

Our Educational Experiment as an Alternative to Integration

When we started our work fourteen years ago, first of all we made two problems unambiguous. The problem showed: something lacks (as Nicolas Hartman stated it: "the problem is the knowledge

of the unknown"). In vain did we prepare a new experimental program of a subject (drawing) according to the most modern concepts. The other subjects destroyed what we had built up in one subject. Then we realized that the children don't use their organs of senses separately. Seeing, hearing and moving are not separated, but they go on simultaneously. When we had established the integration of the four subjects, we found that motion reinforced visual thinking, visuality helped musical sensitivity and it facilitated linguistic, literary sense of phrasing.

Since then we have planned this *transfer-effect* on purpose. And we asked those questions again that previously seemed to be evident. If talent is an inherent ability, which kind of it, at what age should it be facilitated? Do either too much control or limitless liberalism in teaching prevent the optimum development of talent? Can the emotional, intellectual, volitional and religious ability of a child "directly" be formed in accordance with the psychology (which always touches relations) that can provide help? When are conventions and cliches useful in artistic self-expression and when do they hinder the talent's growth? Can every artistic expression be taught as a *language*—by the example of generative grammar? Is there such a common theory of relativity of arts which establishes synthesising the connection of creation and time? Is there a common language of musical, visual, literary and kinetic creativity? If there is a universal language of arts, are the "mother-tongues" for local cultures? What's the role of analogy in artistic education? When is abstraction necessary and when is association useful?

Where are the barriers of self-expression? What's the optimum proportion of instinctive and conscious creation? When is communal education important and when is autonomous learning preferable? Can the talent be immoral? Can the cultural disadvantage be an advantage? Does children's art exist? Can the interdependence of "ontogenesis" and "philogenesis" be found in children's artistic expression? What's the difference between aesthetic and artistic education? And the last one: can an experiment be successful in a school which is determined by a rigid state system—if there isn't a similar way of reform-experiment in the society (state) itself?

Language as Precondition of Creativity and Synthesis of Time

There is an old Greek word: didaxis. It means the unit of teaching, upbringing, educating. Since we convey our thoughts by a

system of symbols, and we communicate with our whole behavior, it seems to be apparent that the *didaxis* (which is a teaching-like transmission including bringing-up) is always linguistic education. In our experiment we taught every kind of artistic expression as a language (as a system of rules), the "language of music," the "language of motion," etc.

We consciously searched for a common dictionary of the languages of creativity, we analyzed the whole environment as a language. The symbols of subcultures, the negative aesthetic quality of everyday life and the perfect works of art were all natural as a language. An example: contrary of aristocratic, sentimental nurture, our teaching concerns reality, not only beauty. We analyzed the unfinished, imperfect, and deformed objects too. We are striving to acquire knowledge of truth. And we don't want spiritual immune deficiency. Children's everyday life isn't full of pieces of art. What they see at the street-corners, on the subway isn't Michelangelo's David, but many alcoholics, sorrowful people, and much garbage. We had similar problems with teaching the history of arts. In the old-style schools the prehistoric arts always come first, then the Greeks follow and "if you grow up, my kid, we will learn about the modern arts too." We don't teach like this, in our experiment. But through the unit of synchrony and diachrony. Shortly: the starting point for us is always the culture of our age. Then we make acquaintance with historical styles and processes, but at the end of the analysis we return back to our age, which is well-known to children. It is always the "know" that should be compared to. And when we analyze, what Hamlet was like, we have to look at what culture was in China and Mexico at the same time. What was the English literature like when Monet painted? What poems were written in Eastern Europe (which is famous for its poetry) in the golden age of the Indian culture? We try to have the children understand the interdependencies of the whole in these cross-sections of time and in the horizontal and vertical artistic analyses. Using the words of a Hungarian philosopher, Valeria Dienes, it is what we call "synthesis of time." We live in it. Not only in time, but in creation as well. Children create much more than they speak about creativity. But these aspects are interdependent.

Critics of Self-Expression: Autodidaxy, Therapy of Creation

Answering the question if talent can be immoral I can say yes and no. Of course, talent can be used for good and bad things. As creativ-

ity can be returned against mankind too. We didn't give possibility to limitless self-expression in our experiment in spite of the big temptation. (In the past, our old-style schools were so rigid and autocratic that our first step was to get rid of inhibitions.) But we took care of proportions. Rudolph Arnheim said of this question in his "Art and Visual Perception": "Self-expression pushes the topic into background and makes it needless. This method proposes to pour out what we feel in a projective way. Our method is quite the opposite, it requires us to concentrate our power of organizing actively on that expression which we find in the world of ours."

I would like to stress the importance of analogical way of thinking. Making comparisons all the time, finding the common and diverse features—these were our basic principles. Children are very good at associations. We have always encouraged it with some restriction of leading them on some level of abstraction. We have given each student the key of his own education (autodidaxy) in his hand. Later, many children don't have the opportunity for organized (institutional) education. They need autonomous learning. (I cite the book of one of the best experts on this question: "A Future for Lifelong Education" from Ettore Gelpi, UNESCO, 1979.) And, with a simile, a greater expert I can refer to Auntie Mary, a country scrubwoman whose words I like to quote: "My dear, everybody carries the medicine of their own illnesses in themselves . . . Everybody learns by their own trouble." Auntie Mary was right, and now we are the therapeutic appliance of integrative artistic education. It is well-know that many mentally unhealthy people live among us who are in a disadvantageous position. For them, creativity can be a way of recovery as it has been proved by several Eastern European examples, mostly by that of Poland. If conditions are given, everybody is able to cure themselves. Conditions can of course be ensured by the existing human community. Our experiment involved little groups of leisure and summer camps which made every participant discover their own talent by the safety of love. (Their initiator was a sociologist named Istvan Kamaras and many young writers, under the title of "Camps for young writers.") These camps reinforce self-recognition and connections in the same way that artistic workshops, clubs of people having common work or the more and more popular religious "basic communities" in Easter Europe do. During our works in the camps for young writers, I listened phrasing it in the following way: "It is necessary for the talent to work, because if somebody doesn't make it

work, and he doesn't give the others what he has, he gets ill from the withheld power." How to give is what should be taught. It needs no comment. That was the "theology" and therapy of talent, in our little experiment. Or the art of the faith.

Talents

Talent and the Culture

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The cultivation of talent is an immense task that has so many facets and complicating relations that even to discuss it seriously can involve us in a rather discouraging confusion. A comprehensive treatment of it must involve biological, psychological, social, economic, political, moral, and spiritual factors. Interrelating the analysis of these to achieve anything like a solution to the complex problem of identifying and developing talent is like tackling a gigantic jigsaw puzzle without the advantage of a picture of the whole.

Obviously much has been and is being done to critically examine particular elements or pieces of this puzzle, but it seems to me that the background of the whole picture deserves more attention than it ordinarily receives. I refer to what might be called the genuine excellence. I do not mean that we don't talk and write about "excellence" a great deal and work seriously to achieve it. But something of basic importance still seems to elude us and frustrate much of our effort. In the United States, at least, I believe this something is a deep-seated satisfaction that is ingrained in our culture like a demonic power that so far has successfully resisted every attempt by the exorcists, those who are serious advocates of excellence and are willing to engage in quite radical efforts to achieve their ends.

It is now quite generally held, contrary to the early tradition in metaphysics, theology, and psychology, that there is no fixed human nature that is to be manipulated by the techniques of education in the pursuit of specific purposes. Rather, the self is a growing, creative, dynamic congeries of genetic impulses affected by the impact of countless internal and external forces that shape the character of the person and determine his or her attitudes and actions. The individual person is in large measure a product of the culture, that vast inter-relation of values, beliefs, attitudes, ways of knowing, techniques of synthesis and analysis, dispositions, feelings, and modes of action that in various ways shape not only the character of the individual but as well the structure and quality of the social order, or social disorder.

My comments on this subject will grossly oversimplify this im-mensely complicated matter. In one sense, we can describe two widely divergent kinds of culture which have contrasting political, economic, and other social characters: totalitarian culture, which locates purpose and value primarily in the total whole; and demo-cratic culture, for which value and purpose are identified first in the individual person and only secondarily in the corporate society. There is, of course, a large middle ground between the extremes, and a variety of socio-political systems have occupied this ground. In every culture there are both strengths and weaknesses in the matter of the cultivation of talent. The strength of a totalitarian society lies in its closed police state and in its regimentation and exploitation of the individual, the subordination of his interests to the purposes of the social order, the shaping of his abilities to fit the goals of his leaders, usually the geo-political integrity of the state and its military power. Here the educational establishment is fashioned to support a system that not only subordinates, but actually sacrifices the individual in the interest of what is theoretically considered to be a higher good. Of course, the practice never fully conforms to the theory, and the theory is indifferent to the facts.

The crowning evil of a totalitarian culture, the failure to place su-preme value in the individual person, is all too evident. My interest here is not to argue against the totalitarian societies, which are their own worst enemies, but to identify the factors in a democratic cul-ture, in particular the culture of the United States, which thwart our purposes and frustrate our best efforts to fully cultivate the creative talent that lies latent everywhere. In this matter we usually point to the schools to give blame for failures and credit for successes, and

this obviously makes a certain amount of sense, or to the homes and family, and this probably makes even more sense. But the location of such causes is not as simple as either school or home. It is the culture itself. Of course, the school and home are expressions of the culture and are basic factors in the culture. But they are not the whole of the culture, which includes a great complex of tradition, morals, religion, political and economic attitudes and action, and a thousand other things that together determine the nature and quality of the social structure and are the chief determinants of the character of the individual person.

Now my main thesis is the simple complaint that a democratic culture, notwithstanding its obvious strengths and virtues, suffers from a very serious moral deficiency: the constant threat of addiction to mediocrity. I am here referring especially to the culture of the United States, a nation of great possibilities, great achievements, and great failures. It is not necessary to look very far for the evidences of failure. They are all around us and are a constant embarrassment to us, reminding us of our moral defects as individuals and our fallibilism as a society. The thing that concerns me in considering the importance of creative talent is our penchant for mediocrity—not simply the fact that at far too many points our performance is mediocre, is far less than excellent, but rather that we seem to have an almost inordinate affection for mediocrity. Not everyone, of course, and no one all the time. But probably all of us some of the time and most of us much of the time. But with all of its faults, I am 100 per cent in favor of democracy because its faults are far outweighed by its virtues. I find Plato's estimate of democracy, which he condemned as a bad form of government, rather overdone. Of democracy, Plato, who was one of the chief intellectual fountainheads of totalitarianism, said,

> "No one who has not seen it would believe what life is like in a democracy. In a democracy even the she horses and the she asses walk up and down the center of the street with all the rights and dignities of free men. And all things are just ready to burst with liberty."

This is a humorous caricature, but here Plato pointed up the basic problem with democracy—the reconciliation of freedom and equality. We need not agree with Plato or with the remarkably perceptive description of life in America by Alexis de Toqueville, who

wrote in the nineteenth century that Americans love freedom and they love equality. But they love equality so much that to ensure equality they are willing to sacrifice freedom. We need not agree with their judgments, but the statements of Plato and de Toqueville should at least be disquieting for us, reminding us that there are fundamental problems in our world that will not go away quietly and may not go away at all. We face the difficult task of achieving the just relationship of freedom to equality that is essential to our ideal of democracy, but it is a task that may be impossible. Our failure to fully determine what we mean by "freedom" and "equality" for our culture and to achieve those social arrangements that these require are obviously contributors to our penchant for mediocrity and our apparent inability to adequately identify and fully cultivate the creative talent possessed by our people, talent that all too often lies unnoticed and lost.

Now I think it would be quite impossible to overstate the necessity for freedom in the effort to achieve excellence. Intellectual and artistic talent resides in individual persons who are most effective working alone or in close association with others in small groups. Unless there is genuine freedom, the physical and mental functions essential to creativity — acute perceptiveness, imagination, intuitive ability to grasp the universal in the particular, the aptitude for simile and metaphor, the intellectual power to construct hypotheses and to infer their implications, and other and related capabilities — cannot pull together in the creative process, to say nothing of the necessity for the free expression and interchange of attitudes and ideas.

Our freedoms have been won through centuries of struggle in the arenas of force, oppression, aspiration, and hope. There are freedoms *from* and freedoms *for*. The cultivation of creative talent requires a large measure of both. Freedom from political oppression and social coercion, from ignorance and want, from suspicion and sabotage, freedom from the dominance of both minorities and majorities. And freedom to be a dissident among the orthodox, the freedom to think independently and to speak and write freely, the freedom to be genuinely an individual, a unique and autonomous person.

The term "equality" has many meanings, both evident and subtle, meanings which relate to circumstances which are constantly changing and which are therefore themselves subject to continual variation and refinement. The obvious and commonplace proposition that human beings are in their natural endowments remarkably

different and unequal but that equality in a democratic society means equality of opportunity is at best just the elementary beginning of the discussion on the meaning of equality, a discussion that for a long time to come will demand the best thought of our best thinkers. The achievement of the equality that guarantees that every person is regarded as an end in him or herself and is treated accordingly is clearly an ideal and practical goal that defines the meaning of a democratic society.

My concern here is that our passion for equality, expressed at times in a gross, undiscriminating, and insensitive fashion, sometimes almost as a mass hysteria, can generate an egalitarian mentality that can disregard individual differences and result in the willful suppression of superior ability and genuine creative talent. At times this has been so severe that we seem even to be embarrassed by authentic excellence in our midst. Our egalitarian attitudes can be so extreme that we even avoid a positive use of the word "elite," failing to distinguish, for instance, an elite of intellectual or artistic attainment from an elite of birth with a prominent family lineage, failing to remember that the American Constitution, which we are celebrating this year, was the product of an elite group of statesmen who had in their political insights and executive talents risen well above the abilities of the general public. I don't mean that all of us commit this error, but enough of us to carry much of the weight of public opinion and determine the course of public action.

A comprehensive catalogue of whatever in our culture exhibits our disdain or neglect of excellence or superior achievement and is evidence of our propensity for mediocrity would be most embarrassing to us. Consider for a moment the at worst immoral and at best insipid character of much that appears on commercial television. It is there because the people want it. If the generality of our people wanted better stuff on TV, they would get it. There is plenty of talent around just waiting to be tapped — witness the high quality of much that appears on BBC and on our public television, as well as, too infrequently, on our commercial networks.

Or to take another example of our slavery to mediocrity, consider the quality of our statesmanship, a word that should be used with great care when referring to our public officials at all levels of government. Today the best chance of being elected to public office in the United States is to come across well on television during the endless boredom of our electoral campaigns. Few persons of superb

talent for leadership are willing to subject themselves to this expensive and often ludicrous sideshow, knowing that not their abilities but their profiles and the tone of their voices are what count with an alarming segment of the electorate. We have seen how television can make national heroes of demagogues even while disclosing corruption in high places. All because the majority of TV viewers are capable of being more passionate than rational.

There is no point in continuing this dreary list of such obvious evidences of our general lack of discriminating judgment and appreciation of quality. We are not all guilty all of the time, but most of us are guilty some of the time. It is, of course, a matter of the irrationality and indiscriminate passion of the masses. But the masses are always with us, because we are the masses.

Now what about the schools, which in a democracy are intended to raise the intellectual, aesthetic, and moral cultivation of the masses to an ever higher level, always in pursuit of a general excellence? On this I have only one comment: It is that we have the kind of schools that we want. We say, of course, that we want schools of the highest possible quality. But what we say we want and what we really want are two different things. What we *really* want is what we are willing to commit our resources to. Those communities that really want outstanding schools and make the necessary commitment have outstanding schools. Most of us seem to be satisfied if the schools perform well as 9-to-3 custodial institutions. We pay our teachers good custodial wages. What might we have if great teachers were valued as highly as athletes of moderate ability, or low-level executives, or even questionably talented entertainers? In education, as a rule, we get what we pay for.

Now, of course, against any litany of failure and near failure we can point to the great achievements of modern culture, and these are very great indeed. Science and technology lead the list. There is no need here to dwell on these as they are entirely familiar. Scientific knowledge in some fields has reached unimaginable heights, and the resultant technology, as evidenced in our instruments of automation and cybernation, is almost frightening in its prospects. Enormous populations can now live together, communicate, and enjoy pleasures entirely unknown in earlier centuries. And if by the grace of statesmanship and mutual fear we escape the holocaust of total extinction which so ominously threatens us, there is no telling what great rewards the future may bring.

Will it bring increasing happiness and personal satisfaction to the millions? Or will the world groan even more under the weight of overpopulation, the mindless poisoning of nature, and the destruction of its resources. Will the increased millions starve while the capacity to feed them lies idle? Will freedom be extended to those who are now denied it, or will the power of despots destroy the freedoms that have been won at such great costs? Will the masses of human beings find satisfaction in some kind of interesting, creative vocation, or will the very technology which is now our great achievement reduce them to machines within a gigantic social mechanism where efficiency destroys spontaneity and authority and bureaucracy destroy freedom?

The list of questions could go on and on. A few decades ago they would not be asked, or at least would not seem pertinent, for our culture was imbued with the deceptive faith in an inevitable progress which captured the mind of Europe and America during the centuries prior to the First World War. There was a kind of blind faith that ultimately all is well in the universe, that we are on the side of righteousness and righteousness must eventually prevail. Cruel events have destroyed that faith, and we now must face the fact that our culture and civilization could fail, that even without war its great achievements could come crushing down, that its supreme ideal of the worth of the individual person, fashioned out of centuries of failure and success, frustration and hope, and faith and aspiration, might dissolve from the acids of our own sensate materialism.

So when we raise questions on the worth of high ability and talent, of the absolute necessity now for intellectual, artistic, and moral innovation, adventure, and creative enterprise, it is a matter not only for the fulfillment of the individual's potential, of society's responsibility of the person of uncommon competence. It is also a matter of that person's responsibilities to the society and culture of which he is a part and which has nurtured him, a society and culture which appear to be approaching their summit but which may soon be approaching the precarious borders of decline and disintegration.

Where is the talent for moral and spiritual leadership that can reverse the trend of moral deterioration that infects our society today? The talent for statesmanship that can ensure the internal strength of our nations and lead them to reasonable compromises and cooperation? That can stem the tide of crime that reaches from the highest industrial and financial offices of the land to the evil

panderers of pornography? Who will rescue the religion of the general populace from the irrationalism, superstition, and commercialism to which it has fallen prey?

We know full well that potentially there is great talent, remarkable ability, for all of these tasks. It is lying all around us, waiting to be identified and supported with recognition, encouragement, and whatever instrumentalities are necessary to bring it to fruition. I have the impression that the knowledge and techniques requisite for effectively achieving these ends are becoming more and more available, but at best it is a task of discouraging proportions. Certainly the end will not even be approached until the majority of our people are genuinely committed to the pursuit of excellence. It is obvious that a converted minority, though necessary, is not enough. In a democracy minorities can have a powerful influence, but in this matter the majority is essential. And we are far from claiming a majority. The generality seem still to be content with mediocrity.

It is a strange irony that at the very moment of history when humane idealism places unprecedented worth on the individual person, the individual faces such ominous threats from so many directions —alienation from governmental authority which becomes increasingly distant and unapproachable; the frustrating effect of both public and corporate bureaucracy; the mind-destroying impact of a constant barrage of advertising; alienation from work and vocation through mechanization, automation, and cybernation; the endless intrusions upon and invasions of privacy that issue from public and private institutions. To preserve the quality of personal life is becoming at the same time more and more important and more and more difficult.

Uncommon talent is often found in dissidents and nonconformists, and the independence of their thought and attitudes must be encouraged, but there is no virtue in uncontrolled and irresponsible individuality. The creative process should ultimately be subject to a large measure of rationality, and the worth of its issue should be judged ultimately in public terms. There are no truths, for instance, which in some strange sense belong to a single individual. There is no virtue in simple idiosyncracy and eccentricity. The primary function of the schools is to generate a passion for knowledge and cultivate rational thought and behavior. However many a person is endowed with exceptional intellectual and artistic talents, he or she must be disciplined by knowledge and reason.

I must confess that my comments have expressed a quite deep-seated pessimism with which I am infected. Nevertheless, I am fully aware of the great things that are being accomplished in our time. Certainly there has been no culture in the past with a higher idealism and aspiration. And no culture compares with ours in its scientific and technological achievement, or its material advances, or its viable possibilities for the future. Whether ours has surpassed or even equalled some other cultures in the spiritual, moral, and aesthetic quality of life is, it seems to me, a serious question. Over several millennia great civilizations have come and gone; cultures have risen, flourished, and then moved from the stage of history and there is no reason to believe that ours will be an exception. Already in the presence of high achievement there are threatening signs of the possibility of decline. Even without nuclear annihilation, we may be on our way out.

But if there are no guarantees for our future, as I am sure there are not, we at least can believe that if the future is not fated for us, at least it is not set inexorably against us, for history is open ended, and in our freedom for thought and action we determine its course. In the preservation for the general public, probably far more than we can even estimate. But unless we succeed on a large scale to identify and cultivate that exceptional ability and talent that all too often goes unrecognized and neglected but can be found in every stratum of our society, we may not have that margin of excellence that will make the difference between achieving greater strength and lasting power for the future and suffering the eventual deterioration that has been the fate of so many civilizations of the past.

The Talent Development Process in Young People

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In this research we located persons who had already attained a very high level of talent development and performance. Then we retroactively studied their relevant life histories and have then concerned ourselves with an attempt to find common features within the particular talent areas of *music and art*, *swimming and tennis*, and *mathematics and science.* In this way we have aimed to find generalizations about talent development, nearly all of which might transcend the individuals we interviewed as well as the talent fields we studied. We hope this will provide a good indication of what might be found to be common features across the entire range of talent fields.

Talent development is initially viewed by the young child as play and recreational. This is followed by a long sequence of learning activities that involve high standards, much time, and great deal of hard work. Finally, there are special learning experiences that strengthen dedication to an activity that eventually becomes a combination of work and play—an avocation, a calling, or a lifelong career.

The home environment developed the work ethic and the importance of the individual's doing one's best at all times. This ethic was initially applied to most activities in the home and the school. Later,

this ethic was most directly related to learning and participation in the chosen talent field.

Each group of parents strongly encouraged their children's development in a particularly highly approved talent field and gave much less support to other possible talent fields and activities.

No one reached the limits of learning in a talent field on his or her own. Families and teachers were crucial at every point along the way to excellence. The role of the home changed greatly over time, as did the qualities of the teaching and the qualifications of the teachers. What the families and the teachers do at different times and how they do it clearly sets the stage for exceptional learning in each talent field.

Clear evidence of achievement and progress over more than a decade of increasingly complex and difficult types of learning was necessary to maintain commitment to a particular talent field.

THE EARLY YEARS

Finding a Beginning Teacher

As we have pointed out, the Olympic swimmers, the concert pianists, and the research mathematicians, came from families that were especially interested in sports, music, or intellectual activity, respectively. As young children they had already learned something about the field from parents, older siblings, or friends of the family. Most of the swimmers had already learned to swim before this period, many of the pianists could pick out a tune on the piano or read notes and play them in the home (usually helped to do this by a member of the family), and many of the mathematicians had already done small projects that emphasized science or related topics and had heard and participated in home discussions about intellectual activity.

A beginning regular teacher began to give the pianists lessons by an average age of six, the swimmers got their first systematic lessons in competitive swimming by an average age of eight, and the mathematicians were introduced to mathematics in junior or senior high school. Typically the initial lessons were given in swimming and piano for about an hour each week, while the mathematics was taught about four hours each week. All of the lessons included instruction on specific points and observations of the learners' performance (or work) with frequent correction. In addition some learning tasks (or homework) were assigned to be practiced and perfected before the next lesson.

THE MIDDLE YEARS

Finding a New Teacher

Most of our talented individuals had very good experiences with their initial teacher(s), and many of them had developed a very comfortable relationship with them. However, after a number of years during which they had made relatively good progress in the talent field, or when someone thought that the child could make even greater progress if a new and more expert teacher was chosen. At this point the parents began the search for the best teacher available in the area. While the first teachers typically lived in the neighborhood, the second teacher rarely did. During the search for the second teachers, experts and other informants were consulted to determine what expertise was necessary at this stage. A short list was compiled of the teachers who could satisfy these requirements. Frequently, the initial teacher participated in the selection process.

Typically, the second teacher had a good reputation for developing talent in the field, lived some distance from the student's home, charged much more for the lessons, and was careful in selecting the students he or she would teach. In most cases there was an audition or tryout before the student was selected. The teacher sought evidence of the student's capabilities to date, the seriousness of his or her intentions in the field, and the evidence that there was a strong interest in the talent field.

In the case of the pianists, the new teachers were regarded as being very good or even outstanding. Each was recognized as one of the best teachers in the geographical area and was highly respected in music circles. In some cases the new teacher was also recognized as a good concert pianist. In all cases the teacher expected much more from the young pianist than had the previous teacher.

In the case of the swimmers, the new teacher was usually a coach at a major swimming pool in the area and had a very good reputation of training outstanding swimmers. The swimming teams they trained were usually among the most successful in the geographical area. Here also, the teacher expected a great deal from the young swimmers — more than had been expected or demanded by previous teachers.

In the case of the mathematicians, the new teachers were usually connected with a college or university department of mathematics. In

many cases, these math teachers also taught advanced or graduate courses in mathematics and after a short time encouraged the under-graduate student to enroll in their graduate courses in mathematics. Frequently, the student had been referred to them by friends or colleagues they respected.

THE LATER YEARS

Finding a New Teacher

During the middle years, the talented individuals had become relatively successful in their field under the guidance and instruction of an outstanding teacher. The success so far and their strong interest in the talent field led the talented individuals, their parents, their teachers, and other experts in the field to begin a plan for further instruction for them under a master teacher. A great deal of time and effort and many expert informants were consulted to determine which of several possible teachers (or schools) would be most appropriate for the talented individual.

It should be noted that there are only a small number of master teachers in the country in a particular talent field — perhaps about eight to ten in each field. Some of these teachers have gained a reputation for their role in developing young concert pianists. Others are known for their coaching of Olympic swimmers, while still others are noted as the teachers of remarkable research mathematicians. A great deal of information is usually available about these master teachers, their record for successful talent development of their students, and their personal characteristics — at least from the key people in each talent field.

These master teachers are very careful in selecting the advanced students with whom they will work. Gaining acceptance from them usually requires a great deal of correspondence and support from previous teachers and other experts in the field. Typically, much effort was expended by the student and others in order to get an interview, audition, or tryout with the master teacher. These meetings were planned with even greater care and preparation than the students had previously made for the major public events in which they had participated.

The master teacher's willingness to accept the individual as an advanced student conveyed the expectation that the student could go

far in the talent field. However, this was conditional on the student's giving himself or herself fully to the instruction and the teacher's demands for perfection. Both students and teachers speak of this as "putting oneself in the hands of the teacher without reservation." Whatever initial expectations were communicated to the student at the beginning of the relationship, these expectations and demands were constantly raised until they were at a point where the student was expected to do virtually all that was humanly possible—and in some cases this was greater than any other human had done before. This was especially ture of the Olympic swimmers, who were expected to exceed records beyond that ever previously accomplished by any human being. So, too, was it true of the mathematicians, who were expected to solve problems that had never been solved before.

Editor's Note: Bloom's pioneering work on talent development is very provocative and has opened an entire new field of investigation. From his methods and findings there are already many leads of a variety of kinds for researchers and other investigators to grasp and launch their own studies thereby expanding the findings and insights many fold in this newly opened field. To me, that's an excellent indicator that his work has certainly moved the frontiers ahead.

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Experiences of a Pioneering Multi-Talent Classroom Teacher

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It is with excitement and enthusiasm that I report to you of the development of Creativity and Multi-Talent Teaching at Bella Vista Elementary School in Salt Lake City, Utah. Many years ago, the facility at Bella Vista became involved in *Project Implode* to develop curriculum to implement the research of Calvin W. Taylor at the University of Utah in Multi-Talent Teaching. These are talents required if one is to succeed in the world of work: Creativity, (including Productive Thinking), Planning, Decision Making, Forecasting and Communication. Although Creativity has been only one of the talents, we discovered that we could foster and develop Creativity across the curriculum and within each talent area by teaching Productive Thinking as a process and method to be always used.

With intense effort and active interaction between teachers, we probed, explored and developed curriculum with this new approach. As a direct result students also became more involved with their learning and became "can do" students. The teachers were well developed and expanded in their thinking and became facilitators of

learning and talent developers, not just dispensers of knowledge. Hand in hand, teachers and students expanded their abilities and increased their successes.

Parents also became excited and involved. They wanted to become talent developers at home. As a result, our teachers wrote a *Manual for Parents* to use.

This was an exciting period of time for all who were involved. The exchanges between teachers increased to such a degree that faculty room conversations actually became meaningful and productive. Ideas were shared, developed and expanded to meet the needs of teachers and students. Teachers discovered that as their teaching approach changed, the students became active participants in their own learning; that the *quality* of their work increased; and as their talents developed, their academic skills increased hand in glove in a spiral upward.

Under the Principal's leadership, almost all of the faculty were involved in Project Implode, but to varying degrees. A stalwart core of six teachers arose from the group and formed a writing team. They were imbued with the idea of exchanging their successes by sharing the curriculum and approaches they had developed. As a result, these teachers wrote *Igniting Creative Potential*, a research-based manual to help other teachers to creatively teach the talent areas and Productive Thinking in the classroom.

During this developmental stage, every day in the classroom was exciting. Our students were constantly doing remarkable things so we were excited in the classroom. We were frequently demonstrating with our students before sustained streams of important guests who were quite vocal in their praise. The intellectual exchanges with guests would energize us, resulting in a surprisingly long period of high levels of production.

We also ran workshops for teachers from Miami to St. Louis to Hawaii. We always knew that we learned as much from each interaction with other teachers as we did when we taught our own students. So each experience was enriching and rewarding.

At the height of all this activity, the core group became dissolved, leaving an unfortunate hiatus. The principal and two teachers moved into the district office; a teacher quit to have a family; one member died; and one member dropped out. This left only myself of the core group at Bella Vista. It soon became apparent that the loss of the

leader plus several key teachers almost spelled the death knell for the project.

It became profoundly clear that it was difficult for someone to suddenly find himself or herself at the helm of a school with a project already in place fostering a teaching philosophy and methods that he or she didn't understand and yet be expected to promote and perpetuate it. For example, one new principal supported Creativity as long as it was expressed in dance. The other complicating factor emerged from the replacement of faculty with new teachers. Although some faculty members were still imbued with enthusiasm and a willingness to train new teachers, with the passing of time it became increasingly more difficult. Only a principal dedicated to the philosophy of Multi-Talented Teaching could ensure the continual progress in the school.

Fortunately and incredibly, Multi-Talent Teaching can still be found at Bella Vista. A few of the original total set of teachers are still on the faculty. Under the scope of the district's Gifted and Talented Program, we have monthly meetings for each teacher to share ideas and activities completed in the classroom. The kindergarten through the third grade share as a group, and the fourth grade through the sixth grade share as another group. A particular talent is assigned for each month's sharing. This interaction fosters further development in the classroom.

As for me, I'm a stalwart believer. I have never wavered from the course. I could and would never do less than my best for my children. Certainly I would be cheating students if I didn't develop their high-level talents, in addition to their academic skills. Since I know that Multi-Talented Teaching is clearly a method of teaching which can be used throughout the curriculum, why would I settle for less? Besides, without having thinking and productive students I would be bored to tears.

A bit of missionary resides within me. I still wish to spread the news of Multi-Talent Teaching as well as to educate the students of Utah to respect the pre-historical sites of mankind within their state. Combining my zeal for both, I have just written two booklets available at the Jordan School District on the *Prehistory of Utah* for 4th and 7th grades. Each book has a set of Multi-Talent activities for students to complete. Already the books are being sold throughout the state and are in their third printing. Now I am accomplishing both goals.

I must add that I directly credit my success as a teacher to Calvin Taylor and his research. He has been my mentor, my supporter and due to him my life together with the lives of my students have been exciting in the classroom.[1, 2, 3]

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1. All who know Mary Ann's work salute her for having functioned marvelously in full-time and full-hearted service to all her students. Longer than any other teacher in the World, she has developed a scientifically based approach of teaching and cultivating multiple talents in all of her students.

2. One of her admirers, for example, is a Vice President and philosopher in our university, who visited her classroom briefly; instead, however he chose to stay on and on. Later he gave the invited banquet speech at a statewide CEC meeting in Evanston, Wyoming. His entire fascinating speech was on his chosen title: "An Afternoon in Mary Ann Zimmerman's Classroom." Afterwards, when she and I went up to greet him, he was completely surprised that Mrs. Zimmerman had been in the audience throughout his speech.

3. Editor's Note: Mrs. Zimmerman brought her 25 fifth graders to 25 of my undergraduate students and seated all 50 of them in a mixture on the floor. When she taught the total group, my students were very shocked that they were clearly skunked by the speed and quantity of the thinking responses of the youngsters. This included the number of little hands quickly going up and then down and up again instantly. Our videotapes clearly show the large margin of their victory and their readiness to volunteer "to be the next teacher" while mine stayed glued to the floor. The next day our students unanimously said that they never wanted to be graded against 5th graders in multi-talent functioning activities. Ours did win once, with a response accompanied by full laughter. When a fifth grader, taking a turn as teacher, asked "what is meant by forecasting?" My student (a few days later disclosed to be a radio disc jockey) replied by his body and arm gestures "showing four fisherman in a row casting."

High Level School Achievement versus Creativity

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Both creativity and high academic achievement are furthered by the same general environmental influences — encouragement, example, and educational facilities. But at their highest levels the influences which benefit these two aspects of intellectual functioning are not identical—at times may even be contradictory. Whereas creativity needs emotional freedom to flower, high academic achievement needs emotions to be held in check.

The Study—Overview

The Gulbenkian Follow-up Study, ten years after the original study of gifted children and their controls, has investigated 81% of the original sample, and found a continuation of earlier environmental influences in the young people, now aged between 14 and 23. In particular, their style of upbringing and education was seen to be related to their academic achievements and their creative behavior (Freeman, 1985).

The major aim of the follow-up was to point to the often subtle matters which can affect the development of the children's potential abilities, as well as their satisfaction in life.

What Gives You the Greatest Pleasure?

At times, academic research can be hard, unproductive work. But then a revelation, which was quite unexpected, lights up a whole new area. My question — What gives you the greatest pleasure? — had been designed simply as a pleasant way of rounding off an interview of many hours with the young people.

But, in fact, the responses were so distinct that it was possible to make a comparative study between those who chose achievement as their greatest pleasure — the achievers — and those who took their greatest pleasure in creativity — the creatives. It proved to be an important indicator of outlook and motivation, which could be measured against such matters as scholastic success.

The sample's answer: *What gives you the greatest pleasure?*

Relationships	37%
Achievement	24%
A mixture of things	23%
Creative/aesthetic activities	7%
Nature	5%
Physical activities	4%

Statistically, these comparisons can only be taken as indicators, because to compare these two groups of respondents the numbers of subjects became rather small - 41 achievers and 11 creatives. Indeed, what a small number of the 169 subjects had found their major satisfaction in creativity.

However, the numerical size of the sample was somewhat mitigated by the manner of investigation. The interviews had been conducted in a case study manner, and in fact, all the results below were statistically significant (less than 5%, using mostly chi squares). Hence both statistical data and verbatim reports have been used in a complementary manner to provide a rounded picture.

The Young People Themselves

Gender: greatest personal pleasure	:	*Girls*	*Boys*
Achievement	:	5%	93%
Creativity	:	73%	27%

The achievers and the creatives were diametrically split between boys and girls. Most of the achievers were boys and most of the crea-

tives were girls. Was their choice of pleasure due to learned sex-roles, or innate differences?

It certainly made a difference in their exam results:

Gender: A-levels at grade A	:	Girls	Boys
1 A	:	10.0	1.8
2 As	:	6.7	9.2
3 As	:	5.0	11.0

There are two public examinations in Britain, the O-level, taken at about 16 yrs, and the A-level, at about 18 yrs. Though the girls had actually acquired more passes at O-level, and a similar number at A-levels as the boys, they were considerably less successful in grades — boys obtained twice as many A grades at A-level.

A number of girls spoke about being discouraged from aiming for the very top by their teachers, some of whom pointed girls of the highest intelligence and obvious intellectual ability to college and polytechnic rather than university.

Mary: The teachers thought that nursing would be very good for me, but I didn't want to be a nurse. After I'd entered for a national Biology prize, and my study of the earthworm was runner-up, eventually they agreed that I could apply for university, though they made me change my choices. If I had just been given a tiny amount of encouragement, I could have done a lot better, instead of wasting my energies fighting them.

Arts vs. science: Where earning a living is important — science is the thing. The idea was popular with parents that if you study science you can always pick up arts subjects, almost as hobbies, but that if you choose arts subjects, the sciences would remain closed to you for ever. Not one girl in this sample had gone to university from a mixed-sex comprehensive school, but to colleges of different sorts. Of the 17 boys who went from comprehensive — all went to study science. Girls from single-sex schools, however, did go on to university in the right proportions.

To Parents — Which is More Important in Education?

Science   51.1%   Arts   8.3%   Neither   39.6%

The message is clear — gifted girls, particularly in a broad, comprehensive type of education, seem to need more support from teachers if they are to achieve their potentials, especially in science.

Emotion: Achievers had the highest hostility scores of any group in the whole sample—but 91% of the creatives didn't manage a single score on the hostility range. Achievers also had the highest peer-maladaptiveness scores of any group—where again the creatives scored nil. Overall, the achievers clearly had more difficulty in coping with emotion and relationships. In the interviews is was largely the high achievers who had been depressed.

The aesthetes also felt themselves to be more empathetic—twice as frequently as the achievers.

Relating to Others: Achievement implies some competition, if only with oneself. It could be that the competitive element in the ambition to achieve runs counter to formation of close relationships, especially with age peers.

Relationships		*Achievers*	*Creatives*
My intelligence is unattractive	:	63%	9%
Older friends	:	17%	—
I talk a lot	:	20%	46%

Both the achievers and the creatives had identical intelligence scores, but perceived them quite differently. The achievers saw their high intelligence as an aspect of themselves which other people would not like, while the creatives largely disregarded it. The differences were clearly in self-concept, not in ability.

The creatives were much more communicative and, to the interviewer, livelier and more fun.

Cognition: There were some cognitive differences. The achievers claimed significantly more often that they had better memories which specialized in facts: indeed, they appeared to be very good at assembling and reproducing information. The aesthetes claimed better visual memories, which they relied on more in examinations.

Age: The satisfaction in creative endeavour which the achievers had had in their childhoods, began to fall off as they reached 18, and in fact by 20 none of them claimed it. The rest of the sample, including the creatives, kept a fairly steady satisfaction in creativity as they grew up.

Leisure: The achievers actually had a greater variety of spare time activities than the creatives, but relatively fewer of them were creative ones. For example, they watched a wider range of TV and played

more sport, but less frequently wrote poetry. The achievers who had been accelerated, however, did not take part in as much sport. The aesthetes had significantly greater perseverance in their own interests, and did seem to be more autonomous in their choice.

Leisure	: Achievers	Creatives
Do creative things outside school	: 61%	91%
Watch serious TV	: 24%	46%

Education

Do you like school? The creatively inclined children in this sample were less happy with their schools than the academically motivated. They considered school in a different way from the achievers—thinking up significantly far more ways in which it could be changed for the better, as they saw it. Far more of the creatives had serious problems at school.

It looked as though the creatively inclined had much greater difficulty in fitting in with the system—or the system was insufficiently flexible to cope with them. Perhaps this was why they did less well in their exams.

Liked school	: Achievers	Creatives
Didn't like it	: 10%	36%
Liked school as it was	: 24%	—
Want 2 or more changes	: 24%	55%
Had a formal problem	: 5%	19%

Careers advice: The creatives discomfort in the system also showed in their dissatisfaction with their careers advice, though the more conforming achievers had much fewer overall vocational problems.

Careers advice adequate?	: Achievers	Creatives
No	: 34%	82%

The vast majority of creatives were unhappy about what they had experienced as career advice from school. This was often because they wanted to tread a less conventional path than the high achievers.

Curriculum: Many of the selective schools are, by their nature, high powered and academic, and the pupils often described in heart-felt detail how they suffered from the abuse of academic values there. Some said they felt like ciphers in the official system, a situation which could only lead to sterile thinking, and ultimately to more of the same kind of instruction, rather than education. They would have liked the schools to allow them some easing off from examination pressure, and to have show some concern for the pupils' own values and interests. Creativity at such schools was often mentioned as being stifled.

Carl: "Formalized education stops your creativity"

Being at selective, high powered schools did, however, improve the pupil's exam results.

Homes

There were significant differences in parental attitudes between the high achievers and the more creative young people.

Culture: Culturally, the general ambience and decor of the creative's homes was more carefully considered, and there was a wider range of books around, than in those of the achievers. But, the big cultural difference between the homes of the achievers and the creatives was in the quality of music. The creatives had a much more serious level of music at home, and were far more likely to sit and listen as a family, and almost never used it as background. Overall, the creative children came from homes which gave them more aesthetic example and support. The achievement orientated pupils came from homes where achievement, especially in science, took precedence over artistic appreciation.

The Two Types of Young People

The achievers: Those who took their greatest pleasure from achievement were overwhelmingly male. They were more likely to be introverted, with an efficient method of studying, and a firm control of gratification. The youth accepted the goals and authority of the academic institution which were reinforced by higher teacher esteem and support. He or she also carried this attitude over into non-school authority systems and leisure pursuits.

Martin—An example of a dedicated achiever: Sadly, Martin's academic successes, such as his first class honors degree, turned to dust

as he got them, so that he needed to go on for more. At twenty-one, and in the first year of his PhD, he was worried that he wouldn't be able to keep up the pace. He found it impossible to envisage the future, and could not even muster some youthful optimism. He had always worked very comprehensively. Even at school, he'd read widely about the area, writing notes to summarize it over and over again, as he said, "umpteen times", until he understood the concept behind it.

He seemed, however, to have cut down on his feelings towards other people, moving himself further and further towards the stereotype of the backroom scientist, poring down microscopes by day, and returning alone to his room at night. Yet he never ever took any steps to alleviate the pain of his sorrow, pulling himself deeper and deeper into the mire.

Martin: "I don't really want to know my teachers, because I don't think it works as well if I did. I just want the instruction. I don't read newspapers; they're boring. I'm not interested in politics or anything like that, nor music. It's possible that my scientific education has inhibited my imagination.

To be quite honest, I don't know whether it's false modesty, but can't actually give you two attractive points about me. If people like me I don't understand why. Nobody's ever told me anything about myself anyway. I give up very easily in social life. I never concentrate totally on what people say, or think about what they're saying. It's like I watch them talking, but I won't be taking it in. I'll probably be thinking about the person that's saying it, but not what they're saying. I'm selfish and a bit of a snob as well. And I know I'm negative. It is not so much that I'm different, but I feel alienated. Maybe I'm too sensitive. It's quite a while since I felt angry; I feel disillusioned, and I've given up wondering why I'm here, because it just depresses me."

The creatives: Those who took their greatest pleasure from creative activity were mostly girls. They were less ambitious, less successful in high examination grades, and often seen by teachers as less intellectually able than they actually were. But they were more thoughtful and questioning about the world.

Bridget — an example of a creative: A young poet,

Bridget found it difficult to fit into any of her schools, but eventually emerged with sufficiently good marks to get to university to study art history.

At nine Bridget had played the recorder and wanted to be a musician. She loved reading and wrote poetry. She described herself as "somewhat aloof" (her words) from her class-mates' world of pop culture. Her mother said then that she'd had problems at school, where her teachers thought she might need remedial help.

Bridget's Mother: "Her handwriting is just appalling. She's always had difficulty with it. Now she types a lot of her stuff up—when she has to write quickly and under pressure it just goes. She also finds it very difficult with drawing and painting. Her needlework was a disaster, and we had to go to the school lots of times about it. They thought she was being difficult. She used to come home shaking, really distressed because she couldn't cope with needles.

The school sent her to the child guidance clinic and got her assessed. They said her IQ was at gifted level, but the gap between her co-ordination, her manipulation, and her bodily spatial awareness was absolutely awful.

At first, for her, school was total panic and despair. It used to be a nightmare, and in the end we took her out of junior school and tutored her at home for a couple of terms.

When she only got a C for English Literature O-level, the teacher wrote in her report that she's probably written right out of the topic and gone on to something quite different, which is a bit too sophisticated for that level. They just don't want that sort of answer and they have to mark her down."

Conclusions

The dilemma for educationalists is that when children are selected for more intense, highly structured academic programmes by virtue of their ability to pass examination hurdles, development of the playful, creative approach to their work and general outlook may be positively discouraged by the school, and become stunted.

If pupils have a drive to be expressive and to think for themselves, it is likely that they will be particularly distressed by a school's rigid structure, where teachers are unable, or unwilling, to cope with individuals. It is impossible to ask of pupils that they show creative behavior, and yet not display some reaction against the system and some difference from their fellows.

The majority of young people in the sample felt the need of teachers who would work with them, rather than for them; teachers

who were as concerned with the structure of learning and the pupil's ability to cope as the passing on of information. The brightest described (in their own words) how such matters as self-confidence, perceptual difficulties and personal relationships, were as important in their education as the often excellently taught mastery of skills and knowledge. But for most it was a pipe dream.

It is the very essence of pupils' gifted or creative behavior which is at risk through conformity to social desirability in the classroom. It is a sensitive area in which, not only is their potential contribution too easily diminished, but pupils who feel obliged to subdue their own personalities in that way may also find their self-concept damaged.

An environment in which the exceptionally able child can prosper all round must be balanced; implying enough time with other people to make good social relationships, developing interests outside study areas, and taking part in school and other community activities. What has been seen to happen to these gifted young people needs recognition, and the will of parents and teachers to make sure that the non-examinable side of their pupils lives is adequately promoted.

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Evaluation Report of Jordan School District's Gifted and Talented Programs

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This paper will describe a comprehensive, three-year research evaluation of Jordan School District's gifted and talented (G/T) program, which included a Renzulli pull-out program at the elementary level and a magnet program at elementary and middle school levels.

In the Renzulli program, students were pulled out of their regular classrooms to meet with a program teacher. This program was designed to provide students with talent-development activities and in-depth study opportunities as well as provide the regular classroom teacher with assistance in multiple-talent curriculum development and planning. In the third year of the evaluation study, there were 14 schools with talent pools for third grade and higher.

The magnet elementary accelerated learner (AL) program was established to meet the unique needs of students who learn at a faster rate and who would profit from a varied curriculum and accelerated learning. The program was housed as a totally self-contained unit within a normal elementary school where there was space available. The AL program provides a combination of acceleration and enrichment. All AL students were encouraged to explore subject areas of

particular interest to them and to do so in a more sophisticated fashion than is typical of school activities.

The balance of this report is organized around four topics that were crucial to the project. The first section will address pull-out program implementation issues from a "management of change" perspective; growing pains for this kind of project will be briefly described. Second, student selection will be discussed in terms of equity, efficiency, and effectiveness. The third section will describe how teaching strategies were monitored with a questionnaire to provide teachers with feedback on how the students perceived their classroom activities. Finally, the fourth section will report program outcomes that were measured during the course of the project.

Implementation Issues

Implementation of the Gifted and Talented Program has been a complex process involving parents, regular teachers, teachers of the gifted, principals, central office staff and even the state legislature. Readiness was a key issue as was community perception of the program as being for all children and not just for an elite group of students.

Parent Involvement

A parent ad hoc committee was formed. The committee makes recommendations to the administration and has been involved in community and school level workshops for those interested in programs for the gifted. Many parent groups have worked with the ad hoc committee and then moved to work at their local school level. Parent interest is the greatest motivation for school change. Each school has a volunteer program through which parents can contribute their strengths and help in the development of educational programs. A school level enrichment committee catalogs parent interests and skills and contacts parents whose abilities will complement particular studies and activities.

A handbook, *Program Development for Accelerated Learners*, was developed to help each school assess activities which would help them implement programs for the gifted. This handbook was a guide for the implementation of the Renzulli Revolving Door Model.

Regular staff members and people in the community who were not prepared for the program resisted the implementation process.

All stereotypical attitudes prevailed (e.g., such programs are elitist, if students are gifted they get what they need on their own, etc.).

G/T Resource Teacher Activities

Major problems occurred as a result of a lack of common goals and expectations. A major activity of the resource teachers during the summer of 1987 has been the development of a program operations manual. This manual will be used to help teachers develop programs consistent with other schools, yet specialized for the specific characteristics of their local school community. Items addressed include working with identified students as well as with regular classroom teachers to help them better meet the needs of students in mainstream settings.

Administrative Support

District administration will continue to support those schools implementing programs with some funding for inservice training of teachers. A workshop for principals and faculties has been developed. This workshop will help the school focus on the management of change. Many strategies and materials will be available to a school staff looking at program development and implementation.

Implementation is most successful when based upon community and school readiness. District support and coordination are necessary if programs are to succeed. University training which is field-based seems to have the greatest impact in building teacher skills and commitment. While funding is critical and seems to help schools focus on the needs of the gifted, commitment of the school staff and the community to recognize the needs of the atypical student seems to be the most important factor.

Student Selection

The research addressed these questions: 1) Were selection measures related to program goals? 2) Did each measure improve the overall validity? and 3) Did key constituents accept the new procedures? The goals were to make the selection processes less labor intensive, more objective, and more valid for predicting student performance in each program.

The main goals of the magnet program were academic accelera-
tion and independent student projects. The new selection procedures
addressed these goals by using student achievement test scores; a stu-
dent questionnaire on academic self-concept, autonomy, and inde-
pendent development; and teacher ratings of student planning, moti-
vation, and overall suitability. These sources of information were
combined into a final composite score, which was first used in May
1985.

To assess the validity of the new selection measures, magnet pro-
gram teachers in 1985-1986 rated the suitability of program students
selected by the above procedures. These criterion data indicated that
of the 127 kids selected into the program, 13% were rated as not
belonging in the program, 17% were marginal-to-OK, and the re-
maining 70% were suited to the program. However, the number of
applicants per placement had been very different from grade to
grade. Where selectivity had been high (that is, many applicants),
only 4% of program students were rated as not belonging versus 83%
rated as definitely belonging; where selectivity had been almost nil,
23% were rated as not belonging versus 54% rated as definitely
belonging. After correcting for restriction of range in the group of
students selected for the program, correlational analyses showed that
the final composite score (on which decisions were made) was corre-
lated 0.62 with the criterion measure — strongly confirming the effec-
tiveness of the selection procedures.

The main goals of the pull-out program were academic enrich-
ment and development of thinking skills. To address these goals, se-
lection was based on student achievement test scores, teacher ratings
of students' personal characteristics (independence, effective use of
time, self-discipline, etc.), and higher level thinking measures (such
as creativity, decision- making, etc.). Information within these three
categories was converted to rankings which were then equally
weighted to produce a final selection ranking, first used in September
1986.

To assess the validity of this method of selecting pull-out stu-
dents, pull-out program teachers in 1986-1987 rated the suitability of
students selected for the Talent Pool, using a 5- point scale almost
identical to that used with the magnet evaluation. These criterion
data were collected from three schools, for 389 students in grades 2
through 6. Of the 144 students selected for the pull-out program

using this procedure, 126 were subsequently rated as definitely belonging in the program. Only 12% were rated as not belonging in the program. After correcting for restriction of range in the group of students selected for the program, correlational analyses showed that the final selection ranking of students was correlated .73 with the criterion measure—an impressively strong indication of validity. Also, each of the three main types of measures (achievement tests, teacher ratings, and tests of thinking skills) were significant contributors in their own right to the valid selections.

Feedback from the local program schools has been uniformly positive, indicating very high levels of teacher and program staff acceptance of these new pull-out selection procedures. Anecdotal accounts indicate that the new procedure is much faster, easier, and more defensible than methods previously used.

Major implications of this research are that G/T selection should not be based solely on achievement test scores and that measurement is needed to develop student histories in all program goal areas—especially for those which go beyond traditional academic content.

Monitoring Teaching Strategies

The Educational Process Questionnaire (EPQ) was used to collect information about the use of certain classroom activities and teaching strategies. The information was collected directly from students who described the nature and extent of selected teaching activities. The measures in the EPQ include Reinforcement of Self-Concept, Academic Learning Time, Feedback, Expectations, and Development of Multiple Talents. There were two applications of the instrument: 1) to monitor the extent of treatment in various kinds of research and evaluation studies, and 2) to provide feedback to teachers and thus guide their development in the use of selected teaching strategies.

The EPQ was originally constructed to monitor the implementation of talent development activities in a multiple talent teaching project (Taylor, Stevenson, Ellison & Fox, 1973). The results indicated student performance in talent areas (planning, creativity, out of school activities, etc.) was significantly related to the level of talent development activities in the classroom.

In the Jordan application, a refined EPQ was administered to 74 experimental and control classroom groups (N = 1694, grades 3-6)

across 11 schools. On this sample, information was also available from the Student Activities Survey (SAS), an instrument custom designed to assess student performance and accomplishments both within and outside of school with the following scales: Independent Development (self-initiated learning outside of the classroom), Peer Relations (level of interpersonal and social skills), Aspirations (interest in and knowledge of adult occupational activities), Educational Orientation (interest in academic achievement), Enjoyment of School (the extent to which school is perceived as interesting and enjoyable), and Accomplishments (levels of competence achieved in areas such as computer use, leadership, science, literary composition, etc.).

Reinforcement of Self-Concept and Development of Multiple Talents both had very strong positive relationships (classroom level correlations) with all six SAS scores (r from .42 to .60). Reinforcement of Self-Concept was especially strongly related to Accomplishments, Enjoyment of School, and Peer Relations (rs = .55, .54, and .51). Development of Multiple Talents was especially strongly related to Accomplishments and Enjoyment of School (rs = .60 and .52). Academic Learning Time was strongly related to Educational Orientation, Aspirations, and Enjoyment of School (rs ranging from .40 to .49). These correlations clearly suggest that classroom educational practices were important determinants of a range of student outcomes.

Overall, the results indicated that the gifted programs were effective only where students had a more intense exposure to effective teaching processes measured by the EPQ. They also indicated that teachers differed in the extent to which they used the EPQ-assessed teaching strategies. In particular, these strategies were much more likely to be used by program teachers in Renzulli and Magnet schools. No differences were found between regular teachers in program and control classrooms. These findings strongly indicate a need to pay more attention to program implementation. A general plan with decentralized responsibility for implementation was not enough. Without some form of evaluation to monitor the treatment effect, difficulties can arise. An important implication of this research is that teachers can improve their impact on students by increasing their use of talent development activities in the classroom. Furthermore, the EPQ facilitates this improvement by providing feedback on the current level of such practices.

Program Outcomes

A wide range of possible program impacts was examined: academic achievement, talent (higher level thinking) development, accomplishments, enjoyment of school, social relations, etc. The Student Activities Survey (SAS) was administered to approximately 1,800 students in grades 3-6 of program and non- program schools to assess Independent Development, Peer Relations, Aspirations, Educational Orientation, Enjoyment of School, and Accomplishments. Regular students in pull-out program schools were not greatly affected by the program. Talent Pool students (in high-implementation pull-out program schools only) had significantly greater Accomplishments and Enjoyment of School. Students in the AL program had impressively high scores on all six SAS scales, in each case significantly higher than scores from both the gifted controls and the high-implementation Talent Pool students. Classroom educational practices were important determinants of a range of student outcomes and, in light of the EPQ differences found between program elements, apparently are a key ingredient in program success.

Talent tests assessing Communications, Creativity, Decision Making, Forecasting, and Planning were administered to 88 Talent Pool students, 100 regular program school students, 97 gifted controls, and 104 control students, all in grade 4. The gifted students in Talent Pools of pull-out program schools had higher levels of thinking skills compared to "gifted" students in non- program schools. Regular students in pull-out program schools did not have higher levels of thinking skills compared to control students, indicating further diffusion is appropriate to influence the development of these students.

Because all gifted students (whether benefiting from a program or not) scored extremely high on regular achievement tests, above-level achievement tests were administered to 296 program and gifted control students in grades 2 and 5. The results indicated that G/T programs boosted students' scores on above-level achievement tests. The effect occurred mainly in the earlier grades, and was much larger for AL students (who were exposed to a much larger treatment effect) than for pull-out Talent Pool students.

The wide range of positive results indicates an impressive achievement for G/T activities. Still, effective impacts were only observed in those schools where program activities were implemented in a thor-

ough manner, indicating that the success of such programs depends heavily upon management and implementation procedures.

This research project has shown that programs and practices do make a difference. Appropriate programs can have impact on the development of the gifted child as well as on the program options for all children. The most critical changes occur in settings where problem solving or multiple talent skills are taught. With increased problem solving abilities, students are better able to be self-directed learners. A school-wide team approach is necessary if the benefits are to be realized. It is the school-team approach which facilitates change and program development and implementation.

Learn/Teach Inservice and Formative Student Feedback: Educational Change with Multiple Talents

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This study was conducted as an educational partnership between Cottonwood Heights Elementary School, Jordan School District, and the College of Education in Brigham Young University. The purpose was to formulate and evaluate a prototype Learn-Teach inservice model of higher level thinking skills, for teachers in the field, "The Talented Resource Model for Educational Excellence Using Renzulli Management". The study was funded under a Gifted and Talented Partnership research grant and responded to previous research.

Purpose, Variable, and Subjects of the Study

It was the purpose of the study to compare talent pool and non-talent pool student change in multiple talents and educational process perceptions when the program of Learn/Teach Inservice and Formative Student Feedback was implemented in a gifted and talented pilot educational school. This study involved all of the students, their parents, and all of the teachers in the Cottonwood Heights Elementary School, for a total of 720 students and 29 teachers for Inservice and formative feedback.

Multivariate analysis (MANOVA) compared five multiple talents: planning, decision making, forecasting, creativity, and communication post-tests. Of 23 talent pool students and 67 non-talent pool students of the experimental, all fourth graders were used. This sample facilitated comparison with the Jordan School District post-test results of fourth grader students in other G/T Renzulli schools (Total N 173, Talent Pool n 81) and regular schools (Total N 196, Talent Pool n 81). The number of experimental participants on the educational perceptions test (EPQ) of Cottonwood Heights was larger due to the involvement of fourth, fifth, and sixth grade students. All 314 students from Cottonwood Heights were compared to all fourth, fifth, and sixth grade students in the other G/T schools spread throughout the district. The third part evaluator (IBRIC) helped choose the three schools to be compared based on the similarity of schools.

Methods and Procedures

This investigation was a valuative case study of teachers' efforts to increase levels of higher thinking skills for students. The method educators developed to teach higher thinking skills was to learn/teach multiple talents and receive feedback from their students on their educational process perceptions of methodology needed to teach multiple talents.

The inservice methods and procedures were comprised of:

(1) *Learn/Teaching* the various multiple talents (Implode I, 1971; Taylor, 1984) to teachers with assistance of a university partner, district and evaluation help, principal leadership, and program teacher as mentor to provide feedback to teachers and work as an "assister". Teaching and learning multiple talents and the identifying processes that are needed for teaching multiple talents were the goals.

The Renzulli Management (Renzulli & Reis, 1985) of *Type I*, or gaining ideas and information, was used with six formal one-hour presentations. These classes were team-taught by the university partner, the principal, and talents resource coordinator. *Type II*, or practice and skill building through teaching, was done with the talented resource coordinator spending one or two hours per month modeling in classrooms, one hour per week of teachers teaching their students using Jordan District multiple talent materials, with team-teaching and coordination sessions as desired. *Type III*, or Bright Ideas and

sharing creative products was done in formal inservice sessions as teachers took turns sharing what had worked for them, at grade level team meetings as university partner and talented resource coordinator met with each teacher team, on bulletin boards and publications where students successes were displayed, and at evaluations as teacher met with principal.

(2) *Formative Student Feedback* was the systematic method of feedback from students to their teachers in respective classes by the use of the Educational Process Questionnaire. These feedback assessments from students to teachers were given three times during the school year. Teachers met with talented resource coordinator to receive EPQ feedback information and have goal-setting and planning sessions. Multiple talent pretest information was also given to program teachers so they could plan their curriculum from evaluating their student's strengths and weaknesses in various multiple talent areas. EPQ feedback assessments from students were given by resource coordinator to teachers following the November pretest, and again at the end of January from the interim EPQ test. The final feedback was reported on each grade level and as talent pool/non-talent pool in the school. The principal received the combined IBRIC report as formative feedback indicating strengths and weaknesses for total school improvement.

Evaluation Methods and Procedures

The general approach of the study emphasized comparing change or differences on multiple talents and educational processes needed to teach them. Identifying, describing, and analyzing differences were the methods used for comparing change in talent pool/non-talent pool students.

Post-test data were collected following the inservice program in the experimental school. The post-test data on multiple talents were compared with total groups of Renzulli gifted and talented school groups. Talent test comparisons were analyzed with 4th grade groups because all multiple talents test in 1986 were from 4th grade students. Comparisons of student EPQ responses were made from post-tests with 4th, 5th, and 6th grade total intact groups of students in three other gifted and talented pilot program schools in Jordan School District. Comparisons of pretest/post-test student EPQ response differences were also made within the school. MANOVA, Multiple t-tests,

MANCOVA and Newman-Keuls tests were used for data analysis of the various comparison groups. All data were collected with the assistance or by IBRIC. All tests were computer checked with the assistance of IBRIC trained personnel. All the statistical analysis was analyzed on SAS using Univac at Brigham Young University by the statistical analyst of the Education Department.

Multiple Talent Findings

Question 1: The first question asked was to what extent did 4th grade talent pool and non-talent pool students in experimental and control schools change in multiple talents?

There were significant differences in student mean scores in talent pool and non-talent pool in experimental and control schools. The experimental school students in talent pool were significantly higher on most scales than were any other groups. Non-talent pool students were similar to talent pool students in program school on some scales and significantly higher on some scales. Only on forecasting were experimental non-planning pool students lower than talent pool control groups.

Planning: Results indicated students learned to plan according to their developmental level when they were taught skills. Talent pool students in the experiment school were significantly higher than any other group in planning. Talent pool students in the control program had planning scores that were not significantly lower than talent pool or non-talent pool students of the experimental school.

Decision making: Students in the special program of learning and teaching multiple talents learned to make decisions and ask relevant questions. This skill, seemed to be dependent on individual development levels as far as individual learning was concerned.

Forecasting: All groups of talent pool students in special programs did well on the forecasting talent. Non-talent pool experimental students showed no significant difference from talent pool in control schools. It is apparent that teaching assists in this talent because experimental talent pool students scored highest and non-talent pool experimental students outscored regular gifted students. Talent pool students in the experimental school scored higher in forecasting than other groups. Non-talent pool experimental groups scored significantly higher than other non-talent pool groups and as high as talent pool groups on categories of responses.

Creativity: This talent result was of special interest to the authors because talent pool students are often chosen partially for their creativity scores. Non-talent pool students in an inservice program of learning multiple talents scored higher than their bright contemporaries. Creativity scores for talent pool and non-talent pool students in the experimental school were similar to scores of talent pool students in program schools, but significantly higher than other groups. Talent pool students in non-program school did not score higher in creativity than random controls or non-talent pool students.

Communication: This test involved the ability to name synonyms of various words. It was necessary to understand the concept of multi-meanings of words to score high on categories. Since non-talent pool students in the experimental school scored higher than any comparison group except the experimental talent pool group, it is obvious that they learned language use. The analysis of this communication gave the most convincing evidence that all students can learn thinking skills. Talent pool students in the experimental school scored higher in communication than other groups. Non-talent pool students in the experimental school showed no significant difference in communication skills from talent pool students in gifted and talented program schools. They were, however, significantly higher than other groups.

Question 2. The second question asked to what extent grades 4,5, and 6 talent pool / non-talent pool students in the program school change when compared with similar students in other schools, in perceiving changes in their teacher's methodology for teaching multiple talents?

The most significant finding from students on educational process perception was that students can indeed perceive what is happening in their educational program. One student's perception may not be the same as other students. It may not be the same perception as their teacher, but students can and do perceive change in teacher methodology. This finding was especially evident on multiple talents. This concrete and instructional teacher methodology must include strategies, discussions, and specific models. This made it relatively easy for students to perceive the methodology change. Based on the findings of the study and the review of literature, it was concluded that:

1. All students can learn higher thinking skills with multiple talents. The skills of planning, decision-making, forecasting, creativ-

ity, and communication will be learned and built along with other educational learning processes if a program of Learn/Teach inservice with Feedback is implemented.

2. A gifted and talented partnership program of Learn/Tech Inservice and Formative Students Feedback facilitates the learning of higher thinking skills and multiple talents. Teachers can learn and teach the process and skills to themselves and their students.

3. Formative feedback is an integral part of the learning/teaching process. There needs to be a systematic process of receiving feedback from students as to their perceptions of the learning process and what is happening for them.

4. Student's perceptions of their learning seems to act as a catalyst to learning and facilitates both the teaching process for the teacher and the learning for the student.

5. Learning will take place when people plan, implement, and evaluated their processes. Involvement of all educators in the inservice program assisted in the learning and change that took place on multiple talents and perceptions needed to teach them.

6. Students do perceive what is happening with teacher's methods of teaching. They do see changes in methodology. Abilities to perceive subtle differences such as amounts of feedback are developmental and the most mature students tend to perceive these changes first.

7. Multiple talent teaching requires teachers to change and become learners. Higher thinking can be learned and taught through a cooperative teacher inservice program of learn/teach multiple talents using Renzulli Management of Type I, Type II, and Type III, and feedback of the learning process to facilitate the learning change.

8. Learning of higher thinking through multiple talents needs the premises of criterion teaching, learning, and testing. Teach the concept, test the concept, and receive feedback on the concept.

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Webbing and the
Communication Process

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Although learning is our primary objective in all of education, the evaluation, utilization, application, and the communication of that learning is one of the more global and wholistic goals of Gifted and Talented Education.

Webbing, clustering or concept mapping, is a vital and dynamic component of the communication process. We do not lack ideas; they are situated within our brain's right hemisphere. What we need is a vehicle for tapping that richness. Webbing presents a framework for the brain's right hemisphere. It allows fantasy and imagination, language rhythms, patterns, associations and metaphors to emerge in an organizational framework to then be explained, elaborated upon, connected, clarified, edited, refined, revised and applied by the left hemisphere.

Although the left hemisphere may resist the path of the web, with practice, this technique can be used for technical writing and speaking, administrative program planning, teacher organization of interdisciplinary programs, activities and products, and provision for unique learning styles.

And how does webbing occur?

Like the spider's web, the circular center of the web focuses and entices the learner to enter the framework. But unlike the intentions

of the spider, it is the silk threads or connectors that become the emerging activity, encouraging the learner's right hemisphere through its random framework to elaborate and connect in all its directions the central concept, problem, or goal.

The webbing begins with simple brainstorming techniques. Many of the creativity components (fluency, flexibility, elaboration, originality and risk taking) and SCAMPER techniques (substitution, combination, adaptation, modification, putting to other usage, elaboration, and rearrangement) are utilized even for the more technical products. At some point in the brainstorming process the right hemisphere experiences an "aha" at which time a purposeful direction of thought is taken over by the left hemisphere. The learner is then led to sequencing and connecting between ideas, moves to sentence structuring, and ends in paragraph formation. Informal research by Rico shows that spelling and grammatical errors and poor usage lessen when using this technique because the student becomes more involved in the whole than in each of its technical parts.

The process of webbing of concepts and connectors stimulates the flow of thoughts to produce a written, verbal, abstract or concrete product. Organizing concepts in this manner is a viable alternative to outlining. Right brain dominant learners are surely benefactors of the webbing process.

Whether loosely structured for brainstorming and verbal and non verbal descriptive communication or more tightly structured for informative or narrative communication, webbing initiates and provides not only a framework for the organization of learned concepts but for experiences yet to be undertaken.

The 1987 Year For Argentina's Talented Children with Special Needs

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During 1987, Elizabeth Suzuki was very active, along with recruited assistants, in initiating, organizing, conducting, and reporting a series of different Talented Children Conferences throughout Argentina. Persons from other South American nations were among the speakers and attenders of some of these meetings which are described briefly below.

In April, a conference for talented children, the 13th Conference Fair of the Book, was held in Buenos Aires. A total of 60 people attended and participated in this conference.

In May, another Buenos Aires conference was designated as an International South American Conference, was designed to preview the 7th World Conference for Gifted and Talented Children to be held from August 3-7 in Salt Lake City, Utah, USA. Five speakers were invited and 400 persons attended and participated from Argentina, Uruguay, Paraguay, Peru, and Chile. The speakers were: Jarpa Salgado (Chile), Olga Blinder (Paraguay), Antonio Battro and Elizabeth Suzuki (both from Argentina), and Calvin Taylor, (Chairman of the 7th World Conference, with his travel and expenses financed by the Suzuki Foundation). In June, this International Conference was reported in the Daily Chronicle Commercial in Buenos Aires.

Later in October, the Suzuki Foundation produced 500 copies of the proceedings of this International South American Conference and distributed them widely and freely.

Another Talented Child Conference titled the 3rd World Congress of the Isolated Child was held during August in Argentina under Dr. Suzuki's direction.

In September, a Conference on Talented Children with 120 participants was held at Rio Gallagos in the Province of Santa Cruz. Suzuki was also interviewed about the conference by radio in Rio Gallego (which is way south, even beyond Viedma, the new capital of Argentina).

Another Argentinian Conference on Talented Children was held in October way upstream from Buenos Aires on the Parana River at the city of Parana in the Province of Entre Rios[1]. While there, Dr. Suzuki was interviewed by radio and also interviewed by the daily Parana newspaper. The Daily Commercial Chronicle in Buenos Aires also reported this Parana Conference in October.

In October, Dr. Suzuki worked in Montevideo, the capital of Uruguay, which is directly across the huge Buenos Aires harbor, the second busiest harbor in all the Americas. While in Montevideo she was also interviewed on radio and on T.V. Cablevision about her many activities for and with talented children in Argetina.

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1. Point Iguazu, the three corner point where Argentina, Brazil, and Paraguay meet, is further up the Parana River where the Iguazu River runs into the Parana. Very near this point, on the border between Argentina and Brazil and almost in Paraguay, is probably the most beautiful and colorful multiple waterfalls of all. No matter what the spelling is, the Iguazu (Iguasu) Falls astonish and enthrall all sightseers. When Eleanor Roosevelt first saw these South American Falls, she exclaimed, "poor Niagara!"

A Program for the Identification
of Gifted and Talented Children in Kuwait

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There are three principles which govern the program for identification of gifted and talented children. These principles are:

1. Early identification of the gifted child.

2. The use of a variety of techniques to identify the gifted and talented.

3. These techniques should be used over a relatively long period of time.

Early Identification: The third grade in the elementary school has been chosen as the grade in which the screening stage of the program begins, because the child would have spent two years in the school. This period should be sufficient to have at least a preliminary idea about his or her achievement. Tests of intelligence also tend to be more reliable after the age of seven years.

Techniques of Identification: The Renzulli concept of three overlapping rings representing 'above average abilities,' 'task commitment,' and 'creativity' has been adopted with some modifications. For the initial screening stage 'task commitment' has been replaced by 'high school achievement.' Although it is important to recognize that non-intellectual traits are important factors in identifying the gifted and talented, this step has been postponed to a later stage in

the program. Accordingly the Kuwait model for screening the gifted and talented may be illustrated as follows:
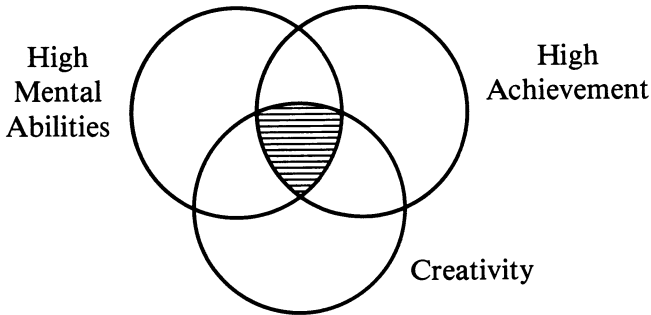
FIGURE 1.

Creativity

Figure 1 - A three ring model for the identification of the gifted and talented in Kuwait. Other criteria will also be used at different stages in the program. These are:

    1. Special ability as manifested in special capacities,

    2. Nonintellective factors such as dedication to a chosen field of productivity or performance, and,

    3. Environmental factors arising from home, school and community conditions.

Stages of Identification: The identification period of gifted and talented children extends over four years. This period has been broken into two stages, the screening stage and the follow-up stage. The latter stage is actually a stage of gathering more information about the gifted and talented. Accordingly, the follow-up stage may be thought of as a stage of selecting the gifted and talented for the special educational program.

Instruments Used for Screening and Selection: Table 1 summarizes the techniques and instruments that will be used in the screening and follow-up stages.

Program Implementation

The program outlined above has been implemented in Kuwait starting with the academic year 1986/87. This program should last for four years which constitute both the screening and follow-up stages.

The Screening Stage

The first year: The third grade has been chosen as the starting point in the program. The first step in the identification process was to get lists of the top ten children in each class at the end of the se-

SOURCE	INDICATORS OF GIFTEDNESS AND TALENT			
	Achievement	Mental Abilities	Creativity	Non-Intell.
CHILDREN	Achievement Tests	General Mental Ability Test	Torrance Tests of	Academic Self-concept
	School Grades	Non-Language	Creative Thinking	Ach. Motiv.
	WISK-K		Question.	
	Self Nomination Form		Self Nomination Form	
				Interviews
TEACHERS	Teachers Rating Scale	Teachers Nomination Form		Teachers Rating Scale
	Grades			
PEERS	Peer	Nomination	Form	Sociogram
PARENTS				Social Form

TABLE 1: INDICATORS OF GIFTEDNESS, SOURCES OF INFORMATION AND INSTRUMENTS

Sex	No. of Gifted Children	Percent
Boys	1682	10.54
Girls	1728	10.83
Total	3410	10.70

TABLE 2: NUMBER AND PERCENTAGE OF ACADEMICALLY GIFTED CHILDREN AT THE BEGINNING OF THIRD GRADE (1986/87)

cond grade in the previous year. Special forms that indicate the name of the child, his or her birth date, number of years spent in each of the first and second grades, his or her grades in the different school subjects, were sent to all public schools in Kuwait. The total number of the top ten children in each class in the second grade amounted to 9630 (4780 boys and 4850 girls). This number constituted about 30% of the total number of children in that grade. Certain criteria of excellence were applied, and a new list of academically gifted children was prepared. Table 2 shows the numbers and percentages of these children.

Table 2 indicates that the number of academically gifted children was about 11 percent of the total school population in the third grade in 1986/87.

Administering IQ Tests: Two group intelligence tests were administered to the pool of gifted children. These were:

1. The General Mental Ability Test, and,
2. The Non-Language Test.

The results indicated that the number of children who obtained an IQ of 125 and above were 450 boys and 363 girls (26.74% and 21.01% of the academically gifted children respectively).

The second year: This step will take place in the academic year 1987/88 while the nominated children are in the fourth grade. The WISC-K (The Kuwait-Wechsler Intelligence Scale for Children) will be given during the period from September to December, 1987. From February of 1988 till the end of April, 1988, the Torrance Tests of Creative Thinking will be given.

The follow-up stage: This stage will take three years. This means that the second year of the screening stage and the first year of the follow-up stage over-lap.

The first year: Beginning with this year an enriching program will be effected. This program constitutes primarily of activities which are designed to compliment the current curriculum. This program should continue until the identification period ends.

The second year: Besides the enrichment program, other instruments of identification will be administered. The achievement motivation questionnaire and the academic self-concept scale will be administered to the children. The teachers and peers will also be given their respective nomination forms. The teachers will also complete

the rating scale designed for them. Social workers will begin to complete the social interview forms by interviewing the parents and children. It is expected that these interviews will continue until November of the following year.

The third year: The enrichment program will continue in the third and last year of the program. The rest of the instruments will be given. By the end of this year a method of weighing the scores yielded by the different instruments should be developed. The resulting weights will be used to select the final list of gifted and talented children.

Multiple Talent Development: Higher Education Applications in Consumer Sciences and Merchandising

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I would like to talk with you today about experiences I have had utilizing multiple talent theory. Many of you found as I did that the idea of Man as a multiple talented being and learner made sense.

About 1977 I was introduced to the work of Calvin W. Taylor at the University of Utah. To review in simplest terms, Taylor originally classified talents into six categories: academic, creativity (productive thinking), planning, communicating, forecasting, and decision making. He later expanded that list by adding implementing, human relations, and discerning opportunities (Taylor, 1973 and 1986).

My first experience with multiple talent teaching was in a California community college. As a young professional I found myself a bit overwhelmed by the diversity of experience of the community college student body. Enrolled in Family Income Management I found 18-year-olds with practically no income management experience and 70-year-olds with a lifetime of highly successful management and investment. To meet this diversity of experience and ability I looked to multiple talent teaching.

The next application was instruction of a one-credit orientation to careers in fashion and interiors merchandising. Again, the problem

was student diversity. Because the course was new, freshmen and seniors alike enrolled. Thus not only was I to deal with diverse career goals and personal characteristics but also great variance in professional preparation.

The solution was multiple talent teaching. Organizationally, the course was similar to the family income management course although simpler because it was only one credit. It consisted of orienting, norm setting, contracting, executing and grading.

The third example was at the University of Houston. As a component of a senior level course in retail promotion I decided to make an assignment which would allow students to utilize their multiple talents. To be brief, in organization it can again be described as orienting, contracting, executing, and evaluating. As before, overwhelmingly the comments were favorable. But even more rewarding was that I could see personal growth occur in students through such activities as shadowing professionals, conducting interviews, and participating in hands-on experiences.

The fourth application of multiple talent theory is drawn from a research project. From educational theory to practical application in the consumer marketplace was an easy step. The focus of the research was retail newspaper advertisements.

Since one of the documented functions of retail advertising is to educate the consumer it seemed logical to investigate whether a specific set of retail advertisements interacted with consumers' multiple talents. Or thought of in another way — Were the advertisers through their advertisements utilizing consumers' multiple talents to reach consumers through as many personal channels as possible?

Research has shown that repetition of advertising messages generally increases favorable action. My thought as supported by educational research was that by being received through multiple channels that an advertising message could be strengthened.

The research design was content analysis. Advertisements of a large retail department store chain were utilized. A sample of ads published in a Houston metropolitan newspaper during a one month period were selected. Sixty ads were evaluated by a seven-member research panel. Additionally a 10 percent sample or 6 of the 60 ads were randomly selected for evaluation by 34 senior level university students with training in retail promotion.

Each research team, the 7 member panel and the 34 seniors utilized a short questionnaire which was developed by the panel and

pretested using a one week series of ads published by a competing department store chain.

The composite means for the responses from each of the two evaluation teams illustrates a pattern of talent interaction. Ranked mean scores of the data generated by the responses of the 7 member research panel to the 60 ads published during the month showed planning to be the most utilized talent followed in order by academic, discerning, decision making, productive thinking, implementing, planning, forecasting, and human relations talents (see Table 1).

COMPOSITE MEANS: 60 ADS		COMPOSITE MEANS: 6 ADS	
Talent	*Mean*	*Talent*	*Mean*
PLANNING	1.59	PLANNING	2.18
ACADEMIC	2.06	ACADEMIC	2.32
DISCERNING	2.09	DISCERNING	2.40
DECISION MAKING	2.18	DECISION MAKING	2.52
PRODUCTIVE THINKING	2.27	FORECASTING	2.68
IMPLEMENTING	3.51	PRODUCTIVE THINKING	3.35
FORECASTING	3.85	IMPLEMENTING	3.54
HUMAN RELATIONS	4.19	HUMAN RELATIONS	4.06

*Response values were 1-5. A low numerical mean reflects talent interaction.

TABLE 1.	TABLE 2.

Nearly identical were the means produced through analysis of the subsample by the 34 senior retail promotion students. For those six ads, planning was utilized most followed by academic, discerning, decision making, forecasting, productive thinking, implementing, and human relations talents (See Table 2). Only the position of forecasting differed in the two rankings.

Much work remains to be done. However, these preliminary findings suggest that although the selected ads did have the potential to interact with several of a consumer's multiple talents a rich opportunity remains yet untapped for retailers to develop appeals capable of interacting with the full range of consumers' multiple talents.

For me the underlying principles of multiple talent theory make practical sense. As multifaceted individuals functioning in a complex society we require the use of all available personal resources. Whether in our roles as educators, researchers, or individuals, we can enhance the quality of life by facilitating the expansion of multiple talents.

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Curriculum Enrichment for All Children with Differentiation of Pace, Depth and Breadth for Those Who Demonstrate the Need

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Identification of Talent through Enriched Provision

Undoubtedly there are gifted children who demonstrate very early in their development that they need a differentiated curriculum; that is a curriculum that provides an appropriate pace, depth and breadth of learning for them which is different from that needed by most other children. However, many educators argue that a considerable number of children cannot demonstrate "gifted behavior" because their environments have precluded the opportunities needed for them to discover their capabilities and talents. Moreover, current thinking on the nature of intelligence (Campione et al, 1984, Flavell 1985, Sternberg 1985, 1986) indicate that given the optimum learning environment, many children, *hitherto unrecognized*, become capable of manifesting "gifted behavior". As educators, therefore, the emphasis should be on providing an *enriched curriculum for all children*. With an educational aim of enrichment for all pupils then it becomes quite defensible to discuss the need for greater individualization and consequently differentiation for those children who need *extension* of the normal curriculum.

Too frequently, when we talk about meeting the needs of gifted children we discuss *curriculum enrichment* thereby implying that

only a few selected children need learning experiences that are satisfying, relevant and personally enriching. Perhaps a more equitable approach would be to aim to provide a broad base of learning experiences which encourage all children to demonstrate gifted behavior. *As* and *when* they demonstrate such behavior — the educators provides *extension* in whatever way and for whatever duration is appropriate for those children.

In this way we provide a framework which encourages continuous identification; which allows for children to grow and change and which negates the traditional view that intelligence is easily quantifiable and more or less static after early childhood.

Fig. 1 shows the web of inter-relationship whereby identification; enrichment and extension are interwoven and form an integral aim for the whole school curriculum.
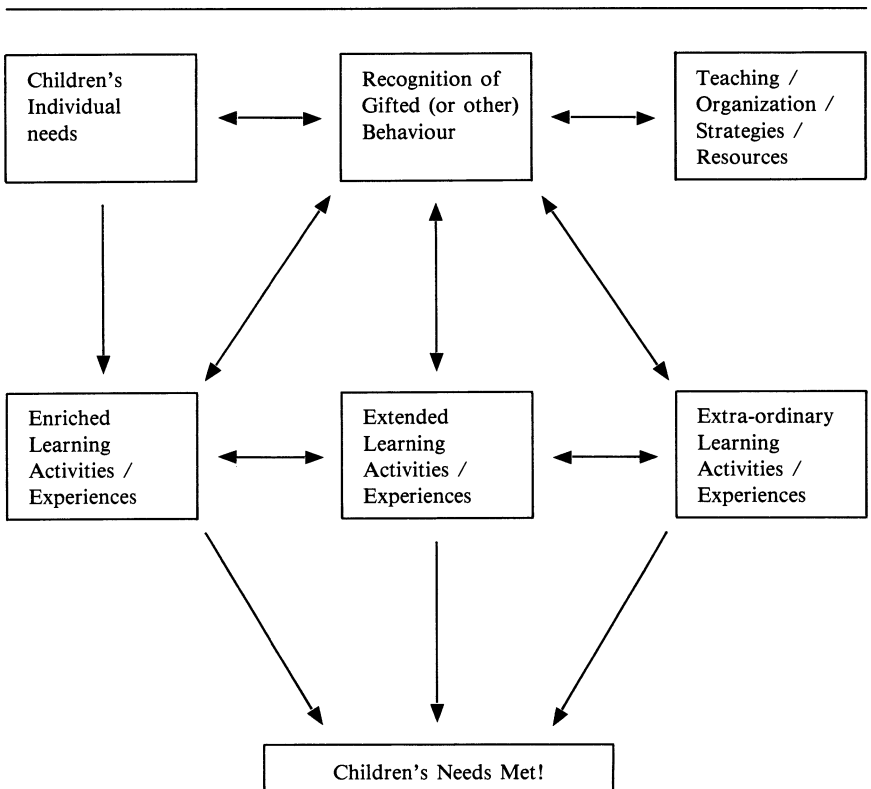
FIGURE 1. WEB OF PROVISION AND IDENTIFICATION

With reference to the concept "intelligence", the traditional view has been that "intelligence" is revealed by high performance on tasks which demand high level vocabulary, predictive thinking and abilities which underlie conventional school success. In fact, the traditional, psychometric intelligence tasks are largely "middle-class" based and were specially *designed to predict* school success. On such tasks, a child cannot demonstrate his/her *capacity* for learning in an optimum environment, nor can s/he be creative and original since the test answers are specific, requiring the "one right solution". A sensitive child needs to have a relationship with the teacher and the peer-group in which s/he feels safe and can take risks with thoughts and ideas. A deprived or underprivileged child must first bridge the gap in his/her learning and skills before s/he can demonstrate high level ability.

An Enriched Curriculum for All Children

There is no better statement of the aims of education for all children than that of the Warnock report (1978) which states that:

> "the process of education should firstly, enlarge a child's *knowledge, experience* and *imaginative understanding*, and thus his awareness of *moral values* and capacity for *enjoyment;* and secondly should enable him to enter the world after formal education is over as an *active participant* in society and a *responsible contributor* to it, capable of achieving as much *independence* as possible."

Implied throughout this statement is the understanding that the aim of education is to promote the growth and maximum development of the learner. The aim is future-oriented, process-based and implies most certainly that the learner is active participant, and is constantly changing. The child systematically develops skills and becomes an independent autonomous learner. The child learns how to learn; knows how and where to find out; develops skills of problem-posing and problem-solving.

The child becomes aware of his/her uniqueness together with social commitment; grows in affective awareness as well as intellectual strength; in spiritual as well as physical domains; in intuitive as well as logical and analytical capacity. The child knows how to plan and organize, has a repertoire of performance and communication

skills, can evaluate his or her own endeavors and monitor personal progress and development. One can argue that a process-based curriculum is applicable to any content areas, but obviously, if the content has immediate relevance to the child, the processes being developed are vitally integrated into the child's current experience and knowledge. There is abundant evidence that skills, understanding and attitudes do not transfer from one context to another unless the child sees the relevance and application. Frequently teachers do not enable children to integrate, make connections, see overall patterns. Education is compartmentalized and fragmented. The learning does not promote the development of the whole child but seeks to give the child a sequence of "tricks" that form a disparate collection of activities.

An enriching curriculum is an enabling curriculum which provides the child with skills that are effective in the sense of giving the child power of action. In contrast, a disabling curriculum is content-based with the teacher as a source of knowledge and the pupils as passive listeners and followers: pupils are assessed on what knowledge they remember rather than on the effective application of skills they have mastered.

Surveys conducted by the Department of Education and Science (U.K.) (1978/1979) found that children were unduly engaged in rote learning, the mechanical filling in of fact-based worksheets and the copying of notes compiled by the teacher — a disabling, inert curriculum.

Within the enriched skills-based curriculum lie opportunities for pupils to work in greater pace, depth and breadth. If all pupils are systematically taught to apply a problem-solving procedure, for example, then teachers and pupils can vary the demand of the task and consequently the challenges to the pupil. The knowledge base of the task automatically changes as the thinking task changes. Within the following framework the teacher can promote efficient, systematic and differentiated rates of learning.

A Systematic Framework for Problem-Solving

— Stating the problem clearly and unambiguously.
— Knowing how and where to find out as much about the problem as possible.
— Generating ideas for possible solutions.

— Deciding on the best idea for solving the problem.
— Putting the solution to the test.
— Evaluating the success of the solution and their efficiency as problem-solvers.
— Communicating solutions to others.

Linked with the problem-solving framework is the project inquiry framework. Again the teacher and pupil can vary the demand of the task according to each pupil's current level of functioning. Far too frequently the "project" approach degenerates into extensive copying from books, with the production of immaculate drawings and neat writing. Favorite projects include: "Birds", "Horses", "Transport", "Rockets" and "Fashions"! The *inquiry* aspect is non-existent and pupils become mechanical and passive "knowledge lifters". However, the "project" approach can be a vehicle through which pupils gain first hand experience, make genuine inquiry and actively develop, in a systematic way, a framework that allows them to rigorously pursue independent study. One can suggest three major stages of skills development.

Before pupils even begin a project they need to ask questions such as:

— What topic shall we choose and why?
— What questions are possible?
— What do we know already?
— What must we find out?

Then comes the planning and doing stage with questions such as:

— Who can we ask?
— Where can we find out?
— What should we record and how?
— How we got what we need?

The final stage is of utmost importance and requires the pupils to evaluate their learning and to monitor their progress by asking questions such as:

— What have we learned/discovered?
— How well did we do?
— How could we improve next time?

Both the problem-solving framework and the project-inquiry framework require additional skills which the teacher gradually introduces into the pupil's repertoire of learning skills. There is no hierarchical order but the teacher systematically builds in an increasingly embracing spiral of skills as the pupil gains mastery. These additional skills include:

— high level reading and comprehension skills
— communication and recording skills
— information finding skills

(adapted from Schools Council Bulletin 9)

The Role of the Teacher

Undoubtedly, the development of a process/skills-based curriculum requires teachers who are themselves competent and independent learners and who have a personal and accessible repertoire of such skills! Equally important is the teacher's acceptance of her primary role as organizer, facilitator, catalyst and guide. In addition, she has to model an approach to learning in which current knowledge is neither finite, nor conclusive; in which she demonstrates a searching for new answers and possibilities. This modelling is most dynamically evident through the quality of her questioning, and it is through her questioning techniques that she provides *extension* opportunities for those pupils who need to work in greater depth and breadth.

In conclusion, the writer is arguing for an enriched curriculum for all pupils within which teachers actively promote the demonstration of gifted behavior and provide opportunities for differentiated learning within a skills and process based approach to learning. Too often gifted pupils receive their "enrichment" for an hour a day or a day a week. For the rest of the time they are not supposed to be gifted! Too often schools have "cut-off points" on an I.Q. scale which separates the gifted from the non-gifted—assuming that intellectual development is static. Too often the classroom teacher absolves herself from any responsibility for the gifted child—it becomes the sole responsibility of the "gifted" teacher.

Providing an enriched curriculum for all pupils does not preclude "extra" activities for those who demonstrate their need for such, but the enriched provision provides a sounder and more ethical base for differentiation and extension.

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Student Leaders, Entrepreneurs, Inventors, and Other Leadership Types

Performances of Studentbody Leaders Remain Unrecognized By G/T Programs and by Official Course Credits on Transcripts

David Simmons, Martha Siggard, Chris Guest, Kevin Pearson, Jacque Morgan, Arch Madsen, and James Peterson

The above panel members asked: Are leaders of the future—a goal that educators claim they produce—emerging more from students who participate in studentbody elections and in student government than from students who never participate in student governing activities at any level? How valuable to students are leadership experiences, including the ability to make decisions and the process of critical and creative thinking, in comparison to formal classroom education?

These questions and others were explored in a panel session at the 7th World Conference for gifted, talented, and creative children. The participants were former elected student leaders along with one creative organizational founder from the business community in Utah.

Martha Siggard was a former University of Utah Studentbody Vice-President when Paige Paulsen was the President. After 6 years of employment, she left her position at A.T. and T. Information Systems as the Executive Assistant to the Vice President of Sales in Los Angeles. Returning then to raise her children in Utah, she was recently nominated and elected President of the Young Alumni Associ-

ation of the University of Utah (the first woman to hold that Young Alumni position). She said she learned some very important things from her student government involvement, and many of those things were applicable in her professional career and now in her Young Alumni work.

The leadership training she received through her involvement in student government was transferable and valuable as she went to work in the business world. This is because in the student government, things have to get done and goals are accomplished with and through other people. The business world is the same way. Learning to delegate, to hire talented people, to manage a budget and work with administrators were key lessons in the student leadership experience—lessons that were not obtained in the formal classrooms.

To her, typical current education is necessary, but she says it definitely needs to be supplemented. Siggard said her finance degree was very valuable when she went on to pursue her career in marketing and financial operations, "But the core of my job was doing those things (marketing and financial operations) *through people*, involving creativity and thinking and delegating and knowing the interpersonal skills—these were the pivotal points in being successful in business."

Business is much more advanced than universities in that point of view. The world of business already recognizes the importance of those skills. At one point in her Mountain Bell career, Siggard was responsible for hiring sales and technical staff. She successfully faced difficult personnel problems with employees much older than she was. Her formal background was useful, but what really mattered was her measure of extracurricular involvement, unidentifiable problem-solving and decision-making skills, and the ability to creatively think through and solve situations.

Siggard is an advocate of supplementing the formal educational process with instruction and supervision which promotes creativity. Statistics, economics, and other types of training are important in any type of business. "But to be truly successful and really shine in a sea of peers, it's going to be the individual who can think and do the crucial creative and critical thinking."

David Simmons, a former studentbody president of the University of Utah and an MBA graduate of Harvard Business School, with recent experiences in managing a sizable new multifaceted business organization, offered further insight. He said that the education system has its flaws because the majority of institutions provide only

for traditional education (professor lecture, vast note-taking, and formal exams). Simmons said there are other flaws in education in terms of its value in real life, except for its importance on a resume to prove that someone is formally educated. He values the discipline he experienced in high school, and somewhat in college, but beyond that, his formal educational experiences have had little real-life value. Simmons said he has learned more from starting his own business in high school and from being involved in college student government than he ever did in the classroom. "I really perceived it in that order and in that kind of priority because of what I was looking for while I was learning."

His education at Harvard was akin to a technical school curriculum. The courses are non-traditional and are taught with case studies rather than books or lectures. The instructors serve more as moderators than as typical professors. Simmons defines it this way: "It's the only classroom educational experience I've had to date that really involves me because I learned something aside from how to score well on a test and how to sit in class and take notes. I learned how to think." Although Simmons was not trying to downplay his undergraduate experience, he felt he gained more in that environment — eight hours a day at Harvard, compared to almost "not at all" at the college level.

Siggard has taken some courses which employ the Harvard method, and said the thing that kept her striving was the fact that the tools (books, notes, lecture) weren't handed to her. "I knew I had to shine and if I didn't know how to approach it, the eight hours a day were spent finding out what I needed to do. So I was learning *how to learn what and how to do*, instead of being in classes where I was handed information and asked to regurgitate it at the appropriate time." Siggard said her studentbody leadership experience helped her in those Harvard-type classroom situations.

Learning how to think on your feet and think creatively is something crucial in educational experiences as well as in business. As Siggard said, in her former business position, she would hire people with the ability to solve problems creatively and those with the talents to look at a situation and see many possibilities.

Broad, extracurricular experience is important to the college student, especially when entering the work force. There one finds that the Executive Recruiting companies evaluate potential employees by examining the nature of extracurricular involvement, as opposed to

merely reviewing formal educational backgrounds. Siggard believes that many organizations base their decisions to employ an individual upon leadership skills and other extracurricular activities and not just on formal education.

While working about six years ago as a summer trainee in the U.S. Department of Education in Washington, D.C., Simmons completed a survey concerning leadership and course credit. At that time, he found that *only two or three of the hundred largest universities in the nation offered course credit for studentbody leadership experiences.* One was the University of Utah. "It was a very small percentage of universities that recognized any kind of credit or value for that kind of leadership experience," he said. He also noted that half a decade ago, the *largest amount of money per year for which a studentbody leader was responsible for spending* (appropriately and accountably) *was over $1.2 million dollars.* Such highly responsible experiences in leadership should be of great interest to G/T program leaders and researchers.

Chris Guest, former studentbody president of the University of Winnipeg in Canada and also a member of its Board of Regents said his leadership experiences in Canada were a little different. Being a studentbody president could be compared to being a union leader, Guest said. Much of the responsibility was articulating student viewpoints and taking care of their needs and meeting people. Although the Canadian and American methods of student government slightly differ, leadership experience is not offered for course credit at Winnipeg.

Siggard said, "I think the administration of any group, even a high school or junior high school, should recognize leadership opportunities as a credible source of learning and compensate it, evaluate it, grade it, supervise it, encourage it, facilitate it, and perpetuate it."

Kevin Pearson, another former studentbody president, majored in the College of Business and noted a few years later that in the business world, promising persons are sent off to training programs with almost the same titles as used in the multiple-talent totem poles. He became aware that this training could occur to undergraduates in schools of business in preparation for their careers and that he was repeatedly using practically all of these talents throughout his one-year term as studentbody president.

One other observation was that students in finance courses play the stock market with artificial money and receive excellent course

credit for this academic (laboratory-like) experience that had long been acceptable for transcript credit. In contrast, studentbody leaders at his university, until very recently, had never received any course credit for being responsible for administering and spending about two-thirds of a million dollars per year.

Jacque Morgan, the black studentbody president this past year at the University of Utah, reinforced the notion that experiences gained outside the classroom can often be more rewarding than sessions in a classroom. Looking back at her collegiate history, she said that she had had rather frustrating experiences her freshman year. She attended classes and did not get involved in any extracurricular activities or challenging campus lectures or political sessions.

In classes, she was oblivious to almost anything about the students sitting next to her, including a foreigner, a senior citizen, or even to her professor's remarkable background. She felt that she was a pitiful example of a running UTEs fan. She felt empty, left out and knew that there should be more for her at this campus.

Later, she realized that a college experience can mean more than just learning about reading, writing and arithmetic and that classroom time is valuable, but that experience gained outside classrooms can be just as enriching and meaningful.

After surviving the primaries and then winning the election as studentbody president, she learned how to manage a huge studentbody budget, to work with many different types of people, and most of all, she learned an incredible amount about her own strengths and weaknesses. She was able to encounter many of the 25,000 students of diverse cultures, backgrounds, philosophies, personalities and ideas. The administration, while sometimes caught in bureaucratic complexities, are sensitive and responsive to students' concerns and needs.

With exposure to varying academic, social, and political realms of university life, her time outside of the classroom has been spent well and will continue to be. The type of classrooms she likes best are those that present stimulating ideas and information and then let her have and take time to mull these things over in her mind, as her best way of learning.

She feels that she can now do well in any administrative job while now completing her few remaining undergraduate requirements. She has been elected this new school year as the student representative on the State Board of Regents. She has developed new goals and stan-

dards and has made fresh personal commitments to help others whenever she can.

This past year has prepared her for whatever her immediate tasks are to be — and has given her courage to dare to explore the possibilities of the distant future. She savors how much the people who have entered her life this past year have meant to her. All of these comfortable feelings help to ease her anxiety as she continues on her way.

The panel participants seemed agreed that studentbody leadership experience is valuable and should be validated with course credit. They also said that the ability to solve problems using creative and critical thinking processes should be valued at least as much as good marks on knowledge tests or the ability to take good notes. Higher education, and all education, might do well to emphasize these areas and to offer transcript credit recognition for excelling in studentbody leadership accomplishments.

The panel also had come to realize that *some nations in the world* do not welcome and do not hold studentbody elections. This means that nations could be divided into two groups: those that hold studentbody elections and those that definitely do not hold such elections.

The next two contributors, Arch Madsen and James Peterson, only had formal education through high school. However, they were both granted Honorary Doctorates for their career accomplishments and contributions as leaders.

Arch Madsen, the founder, President, and now Chairman of the Board of the Bonneville International Corporation (with corporate offices in its Broadcast House in Salt Lake City), said that much of his leadership experiences came about by discerning and taking opportunities and by his ability to think creatively and educate himself. Madsen didn't have the chance to further his formal education because, at that time, the Depression was in full swing. He had to "face reality" instead.

Stemming from his interest in amateur radio in high school, Madsen affiliated with the Army Amateur Reserve System. He joined the Signal Corps, which was responsible for the communications program in the Civilian Conservation Corps (CCC). It was that experience, Madsen said, that taught him to educate himself and to seize every opportunity to learn and develop himself.

He responded very positively recently when he saw that the talent of Discerning Opportunities had been added as the ninth and cur-

rently last talent in the multiple-talent totem poles. He then spent considerable time stating that this talent had described the story of his life. No one else seemed to understand why he was going in all these different ways in succession, none of which were on orthodox career or existing pathways in the world of work. Others wondered and pondered negatively about these heretofore unknown career paths. He said, modestly, that many of the opportunities to which he responded came about by chance and that luck played some part at the time. — However, he reported that he had definitely discerned these unusual opportunities as creating the best succession of paths for his future.

Madsen remained in the radio broadcasting business, even though when television hit, he was advised to get out of radio. He didn't believe, as the New York advertising experts did, that television would cause radio to become obsolete. He was able to go to New York and participate in the rebuilding of radio broadcasting. "It's anything but dead now," he says.

It could be said that Madsen "earned an on-the-job doctorate" while working in New York. His job, which was about 60-80 hours a week, consisted of traveling more than 100,000 miles and visiting nearly every radio station in the country. He would meet with the broadcasters and management or ownership of the stations to continue the rebuilding of radio.

He said his ability to think creatively has been, and continues to be a valuable tool in his successes. He defines critical thinking as basically analyzing a situation, looking around and learning as much as possible about it, and then trying to make a forecast and prepare for what will happen in the future.

Some of that foresight paid off for him. Back when radio was still overshadowed by television, he bought six radio and two television stations. These gradually developed into Bonneville International, which boasts an internationally acclaimed television station network. Madsen purchased FM radio stations because he knew AM frequencies were technically inferior. "I guess it could all be summed up in this area of just doing some critical thinking and trying to analyze where you are and what could happen and exploring the possibilities."

A new area Madsen has been pioneering is teletext. In 1976, Madsen was in Canberra, Australia and met Sir Charles Curren who was then head of the BBC. At his invitation Madsen visited London

and got his first glimpse of teletext, a service with the ability to transmit 50,000 words a minute in print that can be called up onto a basic television screen. With the help of the British, Madsen brought the service to the United States. Again, Madsen used his creative and critical thinking abilities to realize teletext to be a medium of the future and to visualize its possibilities.

Madsen said similar things of his business. "This broadcasting station is one of the leading stations in the United States, if not the leader in broadcast journalism, and is so recognized. That's due to finding qualified people and encouraging them and helping them to develop all they can, giving them broad experience."

James Peterson, another remarkable leader (who was out of state and unable to come to the panel), was selected earlier this decade out of Kennecott Copper in Utah to become Acting President of Westminster College in Salt Lake City to help this private college out of its great financial difficulties. His previous background included having excellent grades in elementary school and poor grades through high school graduation, after which he worked on several jobs. He became a leader of his union in his early twenties and worked up to a top management level. In his first appearance and speech at the college, he told the students that if one wants to go to college, one should do "as I am doing, by starting as Acting President." He had what it took to make the college ship move upward toward being seaworthy and by then, the college, through a national selection search, had found the best possible qualified person, both educationally and administratively, to replace him as the official President.

Within two years, both the college and the highly selected new president "had ulcers and parted company." At that time, "big Jim" Peterson was recalled to be the official College President. This time, he had what it took to get the college completely out of the red and solidly surviving. He succeeded in doing so because of his leadership qualities and ways of functioning independently even though he had *never* been a higher-education level student.

An interesting description of his case is that he had skipped from high school completely over undergraduate college to become successful as an Acting President and then the official President. Through successfully filling those positions, he skipped completely over all graduate work by being awarded two honorary doctorates for all his career accomplishments including his presidential leadership qualities that emerged as needed at his college. His leadership

was vital to the college's recovery after traditionally well-qualified presidents, according to academia, had previously failed in that challenging task.

Editor's Comments: In separate years, Madsen and Peterson were each awarded an honorary doctoral degree by our university. When Peterson's name was submitted, the awarding committee members were all completely caught by surprise because none of them would have thought of him. But after reading about and discussing his remarkable contributions, they then voted unanimously for him to receive this highest award.

Another relevant case is one in which that year's Studentbody President of a high school, a senior girl, was completely unrecognized in the program conducted by the Senior Class President at her High School Graduation.

A First Statewide Search for Recognizing Top Entrepreneurs in High Schools

Maurice Capson, Seldon Young, and Robert Hill
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Through the vision of economic leaders at the state level in Utah, it was decided to give recognition to other types of awarded persons in addition to scholars in school, to students in the arts and vocational fields, and to those who excel in athletic events. Some debating occurred as to other types and the idea of searching for and rewarding young entrepreneurs was chosen as an important type in producing new ventures outside of schooling during their years in school. These new ventures and these experiences in entrepreneuring could continue into the future beyond schooling years and have positive effect on the future of the students and on their community and society.

Fortunately, Seldon Young, as a very successful entrepreneur himself, donated $10,000 as the single award for first place for the initial year. Across the entire state of Utah, over 60 students were nominated on an entrepreneuring rather than on a schooling basis. Among the finalists, judges selected Robert Hill as the recipient of a $10,000 award as the first 1986-7 school year of the program.

Maurice Capson briefly explained this program at the opening of a large 7th World Conference Plenary Session and introduced Seldon Young. Then in a replay of the awarding session a few weeks earlier, Seldon Young handed Robert Hill the first prize check of

$10,000. In top talented style for a high school senior, Rob Hill spoke briefly to the large audience and recommended that they try to institute a similar entrepreneur high school award program in their part of the world. This short 5 minute awarding session created surprise and awe in the total audience.

Editor's Note: Since then Rob took a reading course on creativity from me that 1987 Fall quarter as he entered our university from high school. He wrote two papers: "On the 1990's Becoming the Era of the Entrepreneur" and "On The Marketing of Creative Teaching." He also took the Form U Biographical Inventory and 5 of his 6 scores were in the 90th percentile rank range. The only one that was lower on Educational Orientation in which he did not see that he might need to go all the way up the ladder through graduate school since he was already earning a good living in his outside business (which he recently sold so he could start a second new and different business).

Two other cases are noteworthy. One is the story of *Craig Embley* who was judged by the system in early elementary school as learning disabled and his teacher openly called him the dummy in the room before the whole class. Thereafter he sought revenge by not fitting the system, but by learning to use all his full highest level brain powers to function in classrooms. So he later became the valedictorian of our university. He also topped his law school thereby receiving $5,000 at graduation and $6,000 for signing up with a top international law firm (see the article by Embley et al, pp. 10-13, in *Gifted International*, vol. V, No. 2, 1988).

At my summer (1988) Talents Unlimited Creativity Workshop, *Wade Geary*, a high school senior who had just graduated, was a featured speaker. While keeping his required formal schooling going including Advanced Placement Courses, he had worked hours on the side on self assignments on which he had been so successful that he became a most impressive "Young Researcher-and-Inventor." He had entered several international competitions and had won first places, the largest for $10,000 and others, collectively for a total of $20,000 to that year's graduation date. He had already produced a marvelous demonstration in his own lab — probably the first photograph in history — of a live muscle cell and a live nerve cell, functioning together side-by-side, outside of a living organism!

Inventions As An Exciting Art (Greatly Abridged Version)

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Being the first speaker after lunch is a very hazardous business anywhere in the United States, except in the State of Utah. Dry laws do have some advantages.

I believe that inventions are important both from a practical and a cultural point of view. I also believe that for a nation such as ours there are only three ways by which it can improve its average standard of living.

The first is to rob another Nation. This has been a classical way which is now going out of fashion. The second is to have enough natural resources to sell and thereby raise its own standard of living. This is not possible for us. A third way is to increase our productivity, that is our efficiency, so that for every hour of production or services we produce more and better output. This has been our traditional method but now is not doing well at all.

The best way to increase our productivity is, of course, by means of inventions and when I talk of inventions I have to mention patents. The first patent system was invented in Venice in 1474. Since that time almost all of the nations of the World have adopted similar systems, including the Communist Countries.

I would like now to tell you about some of my inventions, not necessarily the important ones but the ones I consider fun. Let me

start with the first. My patent attorney, at one time in the late 50's, asked me to design for him a gadget that would tell him whether his telephone rang in his absence, so that he could call his answering service to get the messages. I suggested that he take a microphone, an amplifier, a latching relay and some other equipment to do this. He pointed out that this was not very bright of me. Being an engineer, he could do that without me. He wanted something "simple and inexpensive." This, of course, is much more difficult. After some thinking I suddenly remembered a toy I saw when I was 11. I had just come to the United States and was helping my uncle assemble and sell toys in his store on 125th Street. One of the toys was a cardboard box, shaped like a doghouse, into which you carefully pushed a celluloid dog and when you yelled "Rex" or clapped your hands it jumped out of the box. A very light piece of brass rested against these two wires. When the box vibrated due to sound, the contact broke for an instant and the magnet released the dog. I went home, took a cigar box, arranged a light contact under the cover, used a neon light, and a couple of resistors, and arranged things so that when the contact broke, the neon light lit. When the contact closed, the neon light stayed lit because that is the virtue of the correct circuitry and a neon light. I brought the device to my attorney and he put it on his desk. We asked the operator to ring the telephone. The light lit and both of us were happy. When I got home I had an immediate call from him and he again berated me as an engineer. He complained that he couldn't sneeze, couldn't close the desk, couldn't close the door. When he did this, the light lit. We put a time delay into the mechanism and fixed this problem. My attorney went to the patent office and found the patent on this toy dog. It was issued in 1918. My description matched exactly the description in the patent.

I cite this as an example of what the brain must do to invent. It looks through its large memory and some 30 years after the event recalls the picture and a description of a mechanism that it has stored in its depth. It certainly was not done by looking up an index. There are many reasons for this. For example, I spoke only Russian in 1921. My index would have had to be translated into English. This is out of the question.

This story has a sequel. Some years later I was talking about inventions before a technical society and someone asked me if I could give an example of an invention where I was conscious of the mental process. I started to talk about a toy dog and a man in the audience said "Rex." I said, "That is correct. When did you last see the toy?"

The man said, ''I had this toy some 56 years ago.'' I said, ''How did it work?'' He said, ''It had a loose contact on the back of the box.''

The second story I want to tell is about my invention of the magnetic disk memory. In 1948 the Bureau of Standards was involved with some people in the development and purchase of computers. I was talking to a man who was in charge of the ENIAC Machine at the Aberdeen Proving Grounds. He wanted a large capacity memory with reasonably quick access time. So I invented a system using 20'' diameter thin aluminum disks, coated on both sides with magnetic material. This alone was not difficult because of my work on phonographs I knew that magnetic recording can be done on disks. The thing that is original is that I cut a pie-shaped sector out of each disk and I could mount perhaps one thousand disks on a single spindle, no more than a foot or two long. The cutout sectors would arrange themselves into a trough through which the magnetic heads could travel. When the heads were stopped at a particular disk, that disk could be turned through the heads and both sides of the disk could be read. In this way, in essence, I built a book that could be read without opening the pages. If, for example, there were printing on both sides of the disk, one could read that printing as the disk slowly turned. We built a model, but the machine was never used. Among other reasons it was a little too early in the art. Even though we could record one million bits on a 20'' disk, many people felt that a thousand disks for recording one billion bits was of no use because ''nobody needs that much information for storage.'' You have to remember that this was 1948. Today, on a 3'' disk one can store 16 million bits, and the 3'' disk would fit into the bearing hole of the 20'' disk.

Another invention in the field of information storage that I would like to mention is the idea of using multi-level microfiche. If one takes a set of photographs of printing, for example, and spaces them about 1 / 16 of an inch apart and arranges them as a single block of information, one can focus a projection lens or a microscope viewer on a particular level of such a device without seeing any of the others. I have here such a model. I have a patent on this system of reading three-dimensional storage but I don't know if it has ever been used. People who work with microscopes are familiar with the fact the depth of the field of a microscope is so short that they can see one layer of a transparent material without seeing any of the others.

Sometimes one invents to win a bet. One such example is the story of my invention of a justifying typewriter. When I worked at the Bureau of Standards early in the War, some time in 1943, working with me was a very brilliant mathematician, by the name of David Gilbard. He is now Professor of Math at Stanford. At that time his wife was working as a secretary in the Department of Commerce. She complained that she had to type everything twice to get the lines justified on both sides. She would first type on a conventional typewriter, then she would go to a Varitype machine where the pitch is adjustable and retype each line very carefully so that the lines would come out of equal length. In my immodest way I suggested that it should be possible to design a typewriter that, without any second printing, would make all lines equal in length. My friend, the mathematician, immediately bet me a quarter that this cannot be done. He, of course, assumed that as you type you put the stuff on paper. If you do this, he would be right. What I thought of was to have a machine which has a disk with a complete alphabet on it for each character that could be put on the paper. On an 8 inch line this would require perhaps 80 such thin disks. As one types, each disk would be rotated and stopped at a particular position so that the right character would be facing the page. When a line was finished, but before it could be put on paper, these disks could be squeezed together, if they had springs between them, or spread with wedges to make the line have a fixed length. Then the whole line could be impressed on the paper at one time. It is usually easier to do this by hitting the paper from the back side. I won the quarter bet, went to the Patent Office the next day to see if this idea was new and I found that they had a whole subclass called Justifying Drum Printers. They had springs and wedges, and every idea I had thought of, and many ideas I had not thought of. This did not surprise me.

Some of you may have noticed that I'm wearing two watches. I'm doing this to tell of another of my inventions. In 1945 my wife gave me a present of a mechanical watch. Like all watches, this one did not keep perfect time. I unscrewed the back, moved the lever which sets the rate in the right direction and put the cover back on again. After a few such settings the watch ran correctly. It then began to drift in another direction, and being like everybody else, I cursed. But being an inventor I decided to do something about this. So, I invented the self-regulating watch. You in the audience may try to do

this now. A gentleman in the audience suggests that I couple the setting of the hands to the rate regulating lever so that when I move the hands forward the watch speeds up. If I move the hands back, the watch slows down. This is correct. The next problem that arose is: What does one do when one goes from Washington to Salt Lake City and changes the time by two hours? Again, someone in the audience suggests that a correction of more that 15 minutes should produce no rate change. This is also correct. There are many such things I did and for nine years nobody wanted to use this because they said watches are "good enough." Even though my invention was correct and simple it "really was not necessary." But the automobile industry was experimenting with my magnetic particle clutch and they liked the idea of an automatic clock regulator for cars and they asked the clock industry to produce it. Finally, it was produced and it was used in American cars for some 20 years. In wrist watches the automatic regulator was a dismal failure, however. Benrus did incorporate it. I was supposed to get 10 cents royalty on each watch so produced. The customers that were buying watches did not like to hear that there was a regulator because they assumed that there was something wrong with the watch. It actually hurt sales. The invention was discontinued as far as wrist watches are concerned. It was successful in automobile clocks. Technically it was perfectly satisfactory in wrist watches also, except the psychology was wrong.

I would like now to tell you about another one of my what I consider good inventions. This was my automatic headlight dimmer. I have to start by asking the audience if anybody can venture a guess as to when the first television system was invented. The answer is that it was done by Carey, a telegraph operator, in Boston in 1860. He suggested that a mosaic of photocells could be connected by a large number of wires to a mosaic of lights, and when the photocells saw an image the lights would reproduce it. The scanning system that we know today—that is the line-by-line scan—was invented by a Pole named Nipkow in approximately 1895. He suggested that a disk, now called a Nipkow disk, would be provided with a spiral set of holes. It would run in front of a single photocell and thereby divide the image into little dots that would be transmitted line by line. A single wire could run to a suitable light, and the light again would be behind another Nipkow disk synchronized with the first so that the variation of light intensity would reproduce these dots, again line-by-line. Thus, the image would be produced at a distant point. Nipkow in his

patent, which was issued in Germany, by the way, pointed out that he needed a fast photocell and a fast light to do this. He did not have these but the principal was clear. It was not until many years later that cathode ray scanners were put at work and were fast enough to produce the modern television system. I knew about the Nipkow disk scanner and so I invented a new headlight dimmer. The one sold at that time by General Motors simply had a photocell and a lens. Mine used a scanning system and did not respond to total light but only to bright spots. I received a basic patent on this and demonstrated it to the three auto companies. All of them complimented the device and me greatly, but all felt that the extra dollar that the scanning system costs made it too expensive. This was approximately in the late 1950's. Today, the dimmer can be made without a Nipkow disk by using an array of photocells, but my patents have expired a long time ago.

One of the interesting problems that arose in connection with the headlight dimmer was that the automobile would occasionally see its own lights reflected in a mirror. This would happen when the car was going around a curve and saw a bright reflecting sign. I solved this by arranging things so that when the car did see its own lights reflected in a mirror it would dim its lights, but if the other lights that it saw (the reflected lights) went down at the same instant, the device knew that the lights seen were reflections and immediately raised its own lights. All that would notice if you were very attentive, was a flick of the lights. The lights would stay up again and slowly recover their sensitivity. By that time you have passed the curve and you never saw the flick again. I have a patent on this feature also. Another problem that arose was that going uphill the device would occasionally see street lights and would think they were headlights. The trick was to design a system so that it could distinguish between headlights and street lights even though the intensities were the same, the position were the same, and everything else was the same. A man in the audience suggests that this can be done because the street lights are operated by alternating current and they have a flicker rate of 120 cycles per second. Automobile headlights are operated by direct current and have no flicker. A simple tuned circuit could easily detect the flicker rate. This is correct, and my headlight dimmer did have this provision. The patent was issued on this feature also. This typifies the problem that arises with an invention. Subsequent problems force you to invent improvements and so, instead of having one patent on

a thing like a headlight dimmer, you end up with something like a dozen various modifications and improvements.

An invention which was never used but of which I am rather proud arose from the fact that Robert Berks, the sculptor who did the head of the Kennedy in the Kennedy Center and many other famous statues, asked me to design a machine that could cut statues out of very large pieces of metal. The problem was this, you have a machine standing on this floor with an arm projecting out of it for some 20 feet, and from the end of this arm projects another arm, at right angles, that carries the cutting tool. One could control such a device by scanning a sculpture model made of clay. This is not particularly difficult. The problem is to keep this long arm with weights on its end from sagging. I solved this by assuming that the whole thing can be done under water. A large tank could contain the machine and the statue and everything else. The arm would be made neutrally buoyant. This would have not only the effect of keeping the arm from sagging, but it would also keep down the vibrations, it could control the temperature of the whole system to be constant, and it could also provide suction for taking away the chips of the grinding particles as the metal was cut. I never built the machine, but it would have been fun to do so.

Sometime in the early 50's, I begin to think of machines that could read print. I built such a machine at the National Bureau of Standards in 1954. I believe it still is on display in the Museum of American History of the Smithsonian Institution in Washington. The machine scanned a character, compared it to the characters in its memory and decided with which character in the memory the unknown character made the best match. In other words, it didn't say a character A was an A because of certain features. It compared the A to the complete alphabet from A to Z and produced voltages that were indicative of the match with each character. Then it looked at all the voltages and said the A compares to the A in the memory better than it does to any other. This enabled the machine to read not only perfect characters but characters that were seriously defective. In other words, say the A is only 60% A, but this is a higher percentage than any other comparison. This principle of "best match" is used in most character reading machines today and in many other devices such as voice recognition machines.

In building reading machines it was recognized very early that designing specially shaped characters and special fonts made the ma-

chines cheaper and more reliable then trying to make machines that read fonts never designed for machine usage. You see such characters, for example, at the bottom of your bank checks, or in the shapes that are used on credit cards.

Some time after building the machine, I was talking about what could be done to automate the Post Office. The reaction from the Post Office was very negative. The workers were afraid of losing their jobs. The management did not want automation because they were more interested in the patronage after each election. Reducing the number of employees was far from their desires. Eventually, of course, many of these things changed. Years later my company did develop letter sorting equipment that is used by the Post Office today. Another invention that arose out of that work was based on the fact that letters in these machines are picked up by vacuum and placed in front of an operator who then operates a keyboard that controls the sorting of the mail. Sometimes the letters are fed through a reading machine that reads the mail and the sorting is done automatically. I began to wonder whether it is possible to pick up heavy objects by a small vacuum cup, as for example, in sorting parcel post. One has to use a small vacuum cup because the packages may vary from only a few inches to something that is quite large. The problem was: Can a one square inch vacuum cup pick up very heavy objects? I'll try this on the audience and have some difficulty. The solution is that one can do this if one pressurizes the Post Office building. If, for example, I pressurized this lecture room to 100 pounds per square inch, I could pick up heavy objects, except that the ceiling would come off, the walls will fall apart, we would have to enter and leave the room through pressurizing and depressurizing chambers. All sorts of interesting problems would occur, but at least one could pick up heavy objects.

After I thought of this I began to think if there was any use for this idea which started as a joke. The answer is Yes! There are uses for what I call "high vacuum." One could use it to straighten out the bent body of an automobile. One could put the car into a chamber that could be pressurized to say, 1,000 lbs per square inch. A properly shaped mold could be put against the dented door of the car, the space between the mold and the door could be released to outside air and the pressure on the inside of the door would straighten it out to make it fit the mold. At 1,000 pounds per square inch a square foot of damage would receive 144,000 pounds, or roughly 72 tons. I also

built a small machine where the whole machine was pressurized so we could use thin vacuum lines to pick up very small objects. The machine worked beautifully. A 100 pound vacuum is something to see.

In working for the Post Office, one of the things that one should consider is that in designing any machine to operate with objects, if possible the objects should be designed for the machine. When one designs a stapling gun, one does not want to pick up randomly shaped staples loosely lying in a box. One designs the staples for the gun. This is a philosophy our Post Office doesn't want to learn. This was my approach in designing a language to be recognized by machine. Voice recognition is useful in handling objects where a person picks up a package and tells the machine how to sort it when he or she feeds the package into the machine. It would be nice if the machine did not have to recognize English words as spoken by the average person and whose voice changes during the day because of fatigue or whatever. I began to think that a special language can be designed which a machine could recognize easily. All one needs is ten words to define the ten numerals. One could do several things. One could use words from different languages, words which are very different from each other. Finally, one could design a special language for machine use. It could consist of only three sounds. The sound S, because that is a simple high-frequency hiss, the sound of a B or T which are clear because of their suddenness. Finally the sound like an O or an A which are more or less continuous sound waves. A machine to recognize these three sounds could be built today for perhaps no more than $100. This means that one could use words like AT, SAT, TA, AS, and so on. All one would have to memorize is ten such words for the ten numerals. The Post Office was shocked. They would not consider this. This was not English. They thought it was ridiculous even though perhaps half of the people who sort mail in some cities speak no English at all. But that is another matter.

In my discussion of the magnetic disk file, or the reading machine, or other inventions, it becomes obvious that one of the things one would like to do as an inventor is to invent things before the human race recognizes the need for the device. People sometimes think that one invents to answer a problem, but by the time a problem is recognized, many people answer it. The trick is, of course, to recognize that TV would be a nice thing to do, long before anyone thinks it is possible or knows why they would like to have it. One also recognizes that when an invention is made before its time, whatever

that means, it is bound to be met without enthusiasm because the human race is exposed to so much new trash in art, politics, religion, economics and in technology. The human race has developed a sort of "I'm from Missouri" attitude. Business people are afraid of the financial risk and the various difficulties of producing new products. Even though an invention is technically sound, the models work, the experts agree it is a good idea, it does not mean that the invention can be sold. The human race is a low pass filter that is afraid of sudden changes.

The more I study inventions, the more I become convinced that they are never created logically. The really good inventions, the really startling ones, are done by a process which is very similar to that of the creation of any new object in any art form. The artist takes old ideas, ideas that are known, and puts them together in a new way. The new way is not arrived logically. The logic is a post-mortem thing. Once the new ideas click together and look good, then logic can decide whether the new combination will "work." One then can decide whether it is worth pursuing.

Many people object when I say this. They think there is a basic logic to creativity. I suggest that you try to think of a basic logic for writing poetry, or of a basic logic for writing great music. The decision, later, as to whether the new combination is good or not depends on culture, training and experience. When we think of the invention (combination) first or the logic later, we realize the importance of a good education. One has to have many ideas, in many fields, that can be combined. Then one has to have enough technical training and culture to decide whether the idea is feasible and whether it is important and whether it is beautiful. This cannot be done without great education and this brings me to a point that I would like to stress above all else. Today, our education, particularly in science, is miserable. I suggest as a basic step to correct the trouble is to double or triple the salaries of our teachers. I know that I shall immediately get the reaction saying this alone will not do it. Nothing alone will do it. But if we don't do this, we shall not have good teachers and if we don't have good teachers to inspire our kids, nothing else will work. Our invention productivity is low not because we suddenly became stupid, but because the climate is wrong. We have a climate for great tennis, for great basketball, for great baseball. The South Americans and Europeans have a climate for good soccer. Our climate for scientific achievement, particularly in applied science, is

miserable. The result is that the Japanese are now getting ten times as many patents per person as we do. This is deplorable. People say "Well, they don't win as many Nobel Prizes." This is correct, but this is a temporary situation. Just as we built our economy on European science, they are building their economy based on our science. But as soon as they make enough money so that the dollar or yen is not of overriding importance, they will permit their great scientists to have enough freedom to work in basic science and the Nobel Prizes will start flowing to the Japanese and to others. One must recognize that to do basic science the scientist must have freedom to do things which are not necessarily economically important. One does not tell an Einstein that his theory of relativity must have a pay-off in one year, or that the study of black holes in space today must produce some private profit. Scientists like to do work which no one else
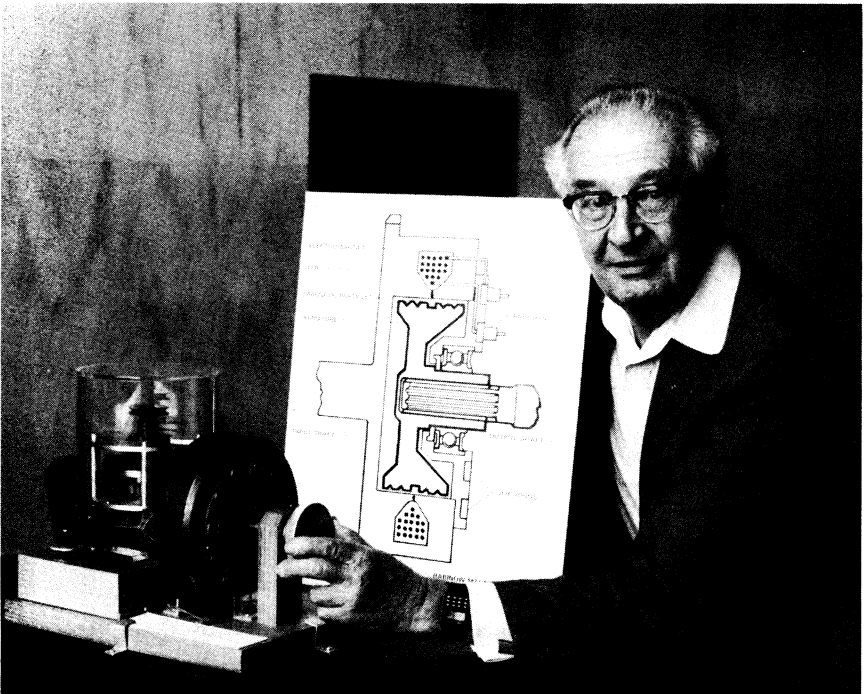
Jacob Rabinow demonstrating his Magnetic Particle Clutch (removed from a Renault automobile). The device mounted on a stand behind the Renault clutch is the first model of the invention made and is at the National Bureau of Standards in Washington, D.C.

thinks important, and they must have enough freedom to do what I call "bootleg work." I have had the privilege not authorized and my bosses had enough wisdom to look the other way. There is a Rabinow Law, I believe it is Number 7, that says "Anything you do illegally, you do efficiently." I do not have to explain the reasons why.

The best general article on creativity that I have ever read was written by William Shockley, one of the Nobel Prize winners for the transistor. See the IRE Magazine for March, 1952. (IRE stands for Institute of Radio Engineers.) The article touched on many important aspects of invention. Among others was that in most human endeavors people are not very different, but in creativity, in output of books, poetry, paintings, music and invention, the difference between the best and the average is very great. He explains this by mathematical combinational logic and I recommend that if you are interested in the basic science of creativity, you look up the article.

While I do say that inventions in the United States are not doing as well as they should, I do not mean to say that inventors should stop inventing. First, of course, we should invent for the pure fun and excitement of doing so, but there are practical advantages. One does get honors, one does get a higher salary when one is an inventor, one can select better jobs and finally, when one does have a job, one can have some freedom to do a little bit of work which is not authorized. All of these advantages are quite real and now and then one invents something which actually makes a profit. Many of our companies have been based on the fact that some inventors have opened up their own corporations and a few have hit it rich.

Project XL:
A Quest for Creative Excellence
Through a National Network
For *In*ventive *T*alents (IT)

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Project XL is grand national partnership initiated to foster *Inventive Thinking Talents* in our nation's schools. Inventive Thinking includes critical thinking, creative thinking, and problem solving skills. These thinking skills are the new tools needed to build a strong foundation for tomorrow in this age of rapidly changing technology. They must be taught along with the "basics" as we know them — *R*eading, *W*riting, and *A*rithmetic. Creative thinking ability has always been considered as an essential element of the arts but seldom has it been recognized as essential to our scientific and technological development.

Why would the United States Patent and Trademark Office develop an educational outreach program to encourage the develop-

ment and proliferation of programs that will teach our young people to think? The answer is simple.

The number of United States Patents issued to foreign nationals is rising at an alarming rate. Less than 20 years ago, foreign nationals were granted only 20% of the number of U.S. Patents issued. Today, that number has more than doubled. The implication of this is all too clear. Maintaining our position as a world technological leader will be an uphill fight. It will take renewed dedication on the part of every American . . . Rejuvenated spirit throughout every sector of our economy . . . A reliance on the reserve strength that has always brought us through every national crisis.

To maintain our technological edge we will have to work harder, and we will have to work better. We will have to look once again to that ol' Yankee Ingenuity. We will have to ensure the strength and viability of those American systems that foster inventiveness and investment . . . To do all we can to encourage those of you who are today's creative thinkers and problem-solvers. But many believe that, for the long term, this won't be enough.

Ensuring that the arrival of the 21st Century will find Americans still at the front of the pack or at the head of the class requires us, today, to find, motivate, and nurture those who will build our future.

We need not look very far. The architects of tomorrow's world are right in our own backyard. Our schools and playgrounds are filled with potential Edisons, Carvers, Marconis, Bells, and Whitneys — but, unfortunately, their potential may not be recognizable under our present systems of education.

Studies indicate that the education America's young people are receiving today does not measure up to that of their counterparts abroad — and as a result, they frequently perform poorly in international competition, especially against children in other industrialized nations. Worse still, some say we are raising a new generation of Americans who will be scientifically and technologically illiterate.

It is time that we add a big "T" for *Thinking* to help our young people prepare for the world of tomorrow by focusing on Inventive Thinking Talent with those who will invent tomorrow.

Project XL is an immediate response to this need. It is an opportunity for all of us to take part in ensuring a sound and prosperous future for America. Simply stated, *Project XL* is designed to encourage the development of programs that will teach our youth to use inventive thinking and problem solving skills.

Project XL will help students at all levels to realize their potential by nurturing their critical and creative thinking abilities as they prepare to meet the challenges of an increasingly complex and competitive world. Secondary benefits from *Project XL* are that young people everywhere, their parents, their teachers and their communities, will gain a raised awareness of the importance of technology to the progress of society and to the strength of our domestic economy. The *Project XL* partnership began with the Commissioner's Education Roundtable, designed to draw upon the talents of public and private sector leaders to establish and implement the *Project XL* goals and objectives. Education, business, government, and and professional and community organizations have come together to ensure its success. *Project XL* exploded into a galaxy of bright ideas that are being implemented by enthusiastic educators across the United States.

Curriculum development is a major *Project XL* initiative. An initial product is the Inventive *Thinking Curriculum Project* — a curriculum guide appropriate for all grade levels and subject areas. The Inventive *Thinking Curriculum Project* introduces the teachers and students to inventive thinking and problem solving techniques. Through critical and creative thinking and problem solving, ideas become reality as the student learns to identify and create solutions to everyday problems. They then illustrate their ideas and create a prototype or model in order to visualize their solution — to make it come to life. Students learn to draw upon outside resources. Parents, family members, teachers and community members support the student and often assist with model-making efforts.

With the Inventive *Thinking Curriculum Project*, educators can develop individualized study courses to suit their students. The Commissioner's Roundtable has produced additional tools to help those educators broaden and enrich their individual programs. For example, the *Project XL Inventive Thinking Resource Directory* provides comprehensive listings of: Current programs to teach critical and creative thinking, Patent Law Associations, Patent Depository Libraries, Inventor Organizations, and more. It also includes a roster of speakers and lecturers from all over the country who want to share their expertise on the topics of creativity, invention, and problem solving.

When students are asked to solve a problem, they must draw upon previous knowledge, skills, and experience. They also recognize

areas where they must acquire new knowledge in order to address or understand the problem. This information, including newly acquired knowledge, must then be applied, synthesized, and evaluated. This problem solving activity leads students to the very highest level of thinking skill. The *Inventive Thinking Project* is a springboard for capturing the imagination, interest and creativity that each of us has within our reach.

Project XL fosters and promotes private sector curriculum development, as well. With the encouragement of *Project XL*, a high school level credit-bearing course called "Creativity and Innovation," is now being piloted in New York State. *Project XL* has discovered imaginative programs at a number of universities across the country and has brought together the professors who established those programs to exchange ideas and share expertise and experiences.

Within the Scientific Library of the Patent and Trademark Office, an impressive collection of literature has been assembled. This collection is called the *Inventive Thinking Resource Center*. The "center" includes books, games, videotapes, and other materials on the subjects of creativity, thinking skills, innovation, and invention—all donated to the Center by publishers and authors throughout America.

Educators and others interested in creativity are free to borrow these material for preview...and to become aware of the exciting resources now available on this relatively new focus in education. Through modern communication techniques, a computerized listing of these materials can be electronically delivered virtually instantly to any library in the country, and books or tapes can be shipped under the inter-library loan system.

Project XL provides opportunities for educators to attend workshops, conferences and inservice education sessions to learn about the teaching of inventive thinking and problem solving. The Patent and Trademark Office has participated in hundreds of workshops, school demonstrations, regional, state, and local conferences. Most recently, a team of professionals from the Patent and Trademark Office presented lectures across the state of Oregon for the Christa McAuliffe Fellowship Invention and Creativity Conference.

How America is to survive and compete in the future is likely to depend upon our most precious natural resource, our school children. *Project XL* is for educators whose task it is to shape the

minds of those who inherit tomorrow and for you who will draw upon those minds for the creation and proliferation of new technology. Join the *Project XL* "starfleet" by encouraging young people everywhere to develop and use their critical and creative thinking and problem solving skills to unleash the *Inventive Thinking Talent* potential that is within each of us.

Abraham Lincoln said, "A child is a person who is going to carry on what you have stated . . . he will assume control of your cities, states, and nations . . . the fate of humanity is in a child's hands."

For more information on *Project XL*, please request "*The Inventive Thinking Project*" a 46 page booklet (by Canedo, Kelly, and Korzelius) by writing to: *Project XL*, United States Department of Commerce, Patent and Trademark Office, Washington, D.C.

The Teacher as a Catalyst:
Helping the Gifted Help Themselves

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Working with gifted and talented youngsters raises many questions and presents many challenges to those who are responsible for their education and development. Parents, teachers, administrators, counselors, and other important educational agents are concerned with providing the best possible programs, determining the most effective ways of implementing instruction, and seeking answers to offering meaningful direction and guidance. Considering the superior abilities and resource assets usually characteristic of gifted children one might be easily mislead into believing that such youngsters need less overt consideration and adult assistance than their average peer counterparts.

Needless to say this is far from the reality of the situation. As research and past experience have indicated, the educational, emotional, and social needs of gifted children are many and varied. In fact the multiplicity and diversity of their needs is one of the major problems to be dealt with both on the part of those developing gifted programs as well as those directly responsible for the delivery of educational services. It is frustrating and frequently overwhelming for any one individual to be a total composite of abilities and skills sufficient to satisfy the demands of some of these children.

Nowhere is this felt more acutely than in the case of the parents of gifted children and the teachers working with them. The implication

is that existing programs must endeavor to be multi-faceted and multi-dimensional. Focal to the success of any program or set of educational services are the teachers who work directly with the gifted pupils. It is necessary that teachers be matched extensions of these programs. What then determines success in working with the gifted? What is the teacher's role and what are the specific and unique dimensions of this role? What makes for pupils' academic success and personal growth? These are some of the questions that will be deliberated in this paper.

The role one assumes and the identity one establishes in a given situation is influenced by many things. Most often among these is one's presenting attitude towards the situation and towards those with whom one will be involved with in frequent and close interaction. For these reasons it is essential that in the case of teachers working with gifted youngsters that there be positive and accepting attitudes on their part towards these children.

There are many existing stereotypes of the gifted, describing them as bookish, eccentric, authority-challenging, in need of constant stimulation, etc. As is the case with many stereotypes, all or none of the descriptions may be true. The importance here is that the teacher not hold to such stereotypes but be open minded and free of unfounded anxiety. The teachers much be positive about these children and self assured enough regarding their own "teaching giftedness" that they will be sufficiently secure to establish a healthy teacher identity and assume a strong teacher role. It is essential as well that teachers be aware of the demands placed upon them by the unique needs of these exceptional learners and have sufficient insight so that their expectations of them will be realistic.

There is no doubt that working with a group of gifted pupils can be a challenging and difficult task. However, this is generally true in situations such as this one where provision must be made to provide for a wide range and spread of learning differences; in ability, pace of learning and pupil interests. While gifted pupils share similarities with other groups of exceptional learners there are, however, certain subtle differences unique to working with the gifted. These differences must be accounted for and certain adaptions made, especially by teachers seeking to offer the educational maximum.

One of the major problems faced by teachers of the gifted is a certain confusion regarding their instructional role. Some see it as that of a spectator and the teaching task as one of networking educational

cross currents as competitive learners vie, one with another. In situations such as these, pupils are in control and the teacher is found standing almost completely outside, looking in as if he/she were tangent to the group. In classrooms such as these, teachers are placed in the frenzied and stressful position of monitoring as it were, a whirlwind gathering momentum, rather than teaching.

On the other hand there are those cases where teachers feel at a loss and wonder what exactly is to be taught, if anything. They view the gifted child almost as a finished product, very accomplished, almost completely able to instruct themselves and primarily in need of enrichment and embellishment. *They do not view the child as instructionally needy* but rather as requiring proper exposure and directed enrichment opportunities. Teachers holding thinking patterns such as these see their role as one of adding to already existing layers of learned facts and skills. They see themselves as passive providers of occasional instruction and more often, of resource materials.

This second position like the first, is suggestive of teacher passivity. What then you might ask is the active role? What teaching interactions are called for that will provide instructional feeding and enrichment and at the same time permit the kind of freedom and expansion needed by children possessing rich inner potential?

First and foremost gifted children need a teacher! A strong, active teacher is needed, one who will maintain a central position in the teaching-learning process. A close look at this role indicates that while traditionally similar there are some suggested differences. It is proposed that a major difference be *the inclusion of a catalytic component*. This catalytic teaching component is one which is founded in the process known as "catalysis." An apt description of this process may be found in Webster's definition: "catalysis—a loosening, release, acceleration of a reaction". The teacher in this case is to be the one establishing the environment and promoting the process described as "catalysis".

The *role is that of a catalytic agent*, the moving force in bringing about "catalysis". The process in question "catalysis," which may be described further as an action or reaction between two or more persons or forces provoked or precipitated by a separate agent or force, is what essentially becomes the teaching-learning process. At the heart of this process, the igniting element bringing about change is the teacher. She is not only vital but indispensable. Her role is cen-

tral and an important one requiring keen insight, flexibility, spontaneity, and academic preparedness.

The demands placed upon the teacher assuming such a role begins with the need for a clear and precise summary of the potential that is in the classroom — the catalytic's field. Careful evaluation and assessment much be made by the teacher regarding the specific and personal assets of the learners. Effort must be made by the teacher to process this information in her own mind so that she can draw upon it quickly when needed. She must know furthermore, when to quietly step back and let pupil energy alone, permitting necessary interactions to build up and develop. She must be ever vigilant and astute in the timing of her interventions.

Knowing when to facilitate the catalysis is perhaps the most difficult part of the teacher's role. Also important is the quality, quantity, and duration of teacher input. Whether it be the teacher acting as facilitater between teacher and pupil, peer and peer, or pupil with resource materials, teacher input must be carefully weighed so as to be in right proportion to what is called for by both the situation at the time and the learner(s) in question. We see once again and realize once more the critical and dynamic role of the teacher who as a catalyst holds the igniting element permitting a process of learning to take place, a process which is both teacher directed and pupil self-directed at the same time.

While some time has been devoted to looking at the process, "catalysis", and the processor, the teacher as catalytic agent, we cannot overlook giving consideration to the learning environment. Since process does not take place in a vacuum, consideration must be given and time spent in preparation of a suitable learning environment. It is essential that the classroom be free-based enough to permit for circulation, movement, exchange, and experimentation with ideas, people and resources. For teachers to catalyze effectively they must have available to them opportunities to engage in a variety of transactions. They must be free to speed up reaction, produce a reaction, provoke, precipitate, inspire, transform, or significantly activate pupils and the energy forces surrounding them.

The teacher must be able to move through the learning environment easily enough to step in and loosen what is becoming too solid, as may be the case where a gifted youngster becomes obsessed in one direction losing perspective and balance. She must be able to move quickly *to give a necessary nudge or to push the right button to*

release necessary mental energy when there is a stop gap and learning isn't flowing readily or to stop it if it overflows to a point of diluting. She must feel a certain freedom to generate from within herself when things are at a stand still. Underlying her thinking and basic to her approach is the desire and goal to activate the child with out destroying, inhibiting, or diminishing his/her potentials.

Those teachers who would aspire to be catalysts will find themselves experiencing the most exciting and rewarding of teaching experiences. *The catalytic contribution is the most generous gift a teacher can give a pupil,* the gift of independence and the ability to know when and how to help one's self. The gifted and talented especially have tremendous resources that they must be made aware of and learn to appreciate and to use in order to benefit themselves and others.

Interpersonal Attractiveness of the Students with Various Achievements in Learning

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For the last twenty years there has been a large interest in children and young people of outstanding abilities. This is confirmed by the many books, articles, and scientific conferences on the subject. Much less attention has been paid to interpersonal attractiveness of students with various abilities and differential school achievement. Since I wanted, in a sense, to fill the blank space, the subject of my article is the interpersonal attractiveness of students with various school achievements.

This research concerned 132 students of a secondary school in Pabianice—a town of 70 thousand inhabitants. The students were about 18 years old. Sixty one percent of them came from educated families, 32% from the working class, and 7% were the children of farmers. Thirty-two students had high achievement, 59 had average, and 41 had a low level of achievement. The average marks of the students with the highest achievement were between 4.5 and 5. The next group had scores between 3 and 3.5, and the group with the lowest marks had the average of 2.5. It must be added here that the lowest score in Plane is 2, and the highest is 5. Art subjects were not take into consideration while counting the average for the last two years.

As to the number of the students with various interpersonal achievements, there were 43 students with higher level at attractiveness, 42 with the average level and 47 who were the least attractive (see Table 1).

SOCIOMETRIC STATUS OF THE STUDENTS

The level of achievements	high	average	low	number of students
High	9	10	13	32
Average	14	21	24	59
Low	20	11	10	41
Together	43	42	47	132

TABLE 1: THE ACHIEVEMENTS IN SCHOOL AND THE SOCIOMETRIC STATUS OF THE STUDENTS

After comparing the students with different school achievements of interpersonal of attractiveness, there appeared to be groups of students. The largest group consists of the students with average scores and low interpersonal attractiveness 24%/, whereas the smallest group consists of the students with the highest scores and high interpersonal attractiveness /9 persons or 6.81%/. The number of the students with the low scores and low interpersonal attractiveness is similar /10 persons, or 7.57%. Special attention should be paid to the fact that 20 persons/ 15% out of 132 tested students have high interpersonal attractiveness in spite of the low scores. That means that almost half of the students with low scores have high sociometric status. Thus, the average students are the most attractive in interpersonal relations. This fact is confirmed by the looking at the arithmetical mean of the number of votes won by each of the tested groups. The mean for the students with high scores was 3.9; for the students with average marks was 4.7, and for the students with low marks —6.2. It is easy to observe a tendency towards an increasing level of interpersonal attractiveness with decreasing level of achievements in learning.

It is worth noting what students are the most and the least popular in the class. Among students who had not been given any votes, there were 5 high level, two of the low, and one of the average level of scores. It is also worth noting that all of 5 students of the high level who had not been given any votes belonged to the best in the tested group of 132 students. The conclusion form this data is that the high scores have a negative influence on the level of interpersonal attractiveness. According to this research, the best students are the least popular ones. This is shown by the fact that none of the students with good scores were given the largest number of votes, therefore none of them can be regarded as the so-called "sociometric star".

There were 13 students who were given more than 9 votes, 5 of them with average scores and 8 with low marks. A small predominance of the attractiveness of the students with low scores can be observed.

Summing up, it should be stated that the high scores of a student causes his low interpersonal attractiveness, whereas the low scores causes much higher attractiveness.

The Relations Between Similar Achievements in Learning and Different Ones, and the Interpersonal Attitudes of Students

In order to investigate whether the similarities between the school achievement of the students have any influence on their attitudes towards the friends, we have considered the number of sociometric votes which had been given by each group to students with the same similar, and different scores.

It can be seen from the chart (Table 2) that the tested students prefer friends with a similar level of achievement. This tendency is more characteristic for students with average and low achievements. The students with high scores also appreciate their friends with average achievements.

To be convinced of the truth of the above statement, it was necessary to look at the mean of numbers of given votes. In order to do so we had to count the average number of votes given by each group to each of 131 friends. It turned out that the mean of the students with high scores is 1.21, for the students with average scores is 2.23, and for the worst students it is 1.55. By multiplying all the means by the correspondent numbers of students of certain levels of achievements, we were given the average quantities. In this way we had the theoreti-

The level of scores	VOTES FOR THE FRIENDS WITH VARIOUS SCORES			
	high	average	low	votes together
High	69	67	24	160
Average	41	176	78	295
Low	15	37	153	205
Total amount	125	280	255	660

TABLE 2: THE NUMBER OF SOCIOMETRIC VOTES GIVEN TO THE FRIENDS FROM THE SAME CLASS

Scores	high	average	low
High	+77	− 5	− 52
Average	−42	+33	− 14
Low	−70	−59	+139

TABLE 3: THE DIFFERENCES BETWEEN THE REAL AND *THEORETICAL* NUMBER OF VOTES IN PERCENTS.

cal average numbers of votes for each of the three tested groups. These data are shown in percents.

It can be seen from the Table 3 that the good students have given 77% of votes more than the mean to peers with the same level of achievements. It proves that we have to do with the number of positive attitudes much higher than average. Good students have given 5% votes less than the theoretical mean for friends with average scores. However, this difference is not statistically important. We can state that the percent of the positive attitudes of the good students to the average one is similar.

On the other hand, the students with low scores had been given 52% votes less than the theoretical mean. when generalizing, the best students have more positive attitudes to friends with the same level of achievement, the average number to the average students and the least to the worst students.

As it is seen in Table 3, the average students have given the good students 42% votes less than the mean, for the worst students, 14% less, and for the students with the same scores 33% votes more than the theoretical mean. Thus, average students have the most positive attitudes, toward friends with the same level of achievement.

The worst students have given 39% votes more than the mean for the student with the same level of achievement. Fifty-nine percent votes less for the average students, and 70% less for the best students. Thus a very strong connection can be seen here. In case of the convergence of the levels of scores, there are more positive attitudes than it would be seen from a theoretical display. The discussed group have fewer positive attitudes than the theoretical number to the students at a similar level of achievement or with the higher scores. On such a basis it can be stated that the convergence of achievement in learning causes in that case the increasing number of positive interpersonal attitudes.

The number of positive attitudes to the students with different, as well as similar achievements is low, and it is the lowest in case of the large difference in scores.

The fewest positive attitudes can be seen between the best and the worst students, and vice versa. In that case we can speak about the mutual low interpersonal attractiveness.

Summing up, it can be concluded that similarities between achievements of students have the most advantageous influence on their mutual positive attitudes, whereas the differences have the least advantageous influence.

Leadership:
A Special Type of Giftedness

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Interest in identifying and developing leadership ability has been of considerable concern since the early efforts of Plato and Aristotle. Currently, this interest is growing as evidenced by a number of articles and books on the topic (Passow, 1982; Gallagher, 1983; Addison, 1984; Feldhusen, 1986; Sisk, 1985, 1986; Sisk & Rosselli, 1987). Leadership was included in the 1972 U.S. official definition as an area of giftedness, yet leadership can still be described as the new kid on the educational block, even though the need for leaders is recognized by most people. *Time* magazine ran a lead article on the need for leaders in 1979 and again in 1984 ran a follow-up article entitled "The Cry for Leaders." That cry must be heard and leadership must be developed if global society is to survive with positive human conditions.

In an effort to identify and develop leadership, a Centre for Creativity, Innovation and Leadership has been established at the University of South Florida in the U.S. to support leadership training of children, youth and adults. The Centre, established in 1981, is currently sponsored by state funds and private funds. The Centre offers leadership training for educators, business, professional individuals

and others throughout the United States and in a number of foreign countries, notably Brazil, Bulgaria, Canada, Germany, Israel, Portugal, the Philippines and Mexico. In addition, two summer residential leadership programs are offered for middle school and high school youth, as well as a summer day program for 4-14 year olds.

Defining Leadership

In examining definitions of leadership, one conclusion that can be made is that there are almost as many definitions of leadership as there are persons who define the concept. Definitions include:

> Leadership is the process of influencing the activities of an individual or group in efforts toward goal achievement. (Hershey & Blanchard, 1969)
> Leadership is the ability to see a course of action that others miss and then follow it with persistence. (Senator Bill Bradley, D. New Jersey)
> Leadership is the process of influencing the actions of individuals, groups and organizations. (Joe Olmstead, Office of Naval Research)

Although the definitions differ, there are some commonalities such as leadership involves influencing others in individual or group efforts and requires skills of persistence, forecasting, problem-solving and action.

The variety of definitions derive from three major theories of leadership: 1) trait, 2) leadership style, and 3) situational which are useful in better understanding the concept of leadership, and in developing programs in identifying and developing leadership.

Trait Theory

Gifted programs that conceptualize leadership as specific behaviors or traits often use task roles in group dynamic activities as identification and screening devices and as aids in programming activities. Examples of task roles include: information/opinion giver, information/opinion seeker, initiator, synthesizer, organizer, clarifier, recorder, summarizer and energizer. Renzulli, Hartman and Callahan (1971) list other behavioral characteristics to identify leadership such as psycho-social skill, cognitive/academic skills and personality characteristics. These leadership traits are similar to those identified

by American Telephone and Telegraph (AT&T): organization and planning skills, high energy level, creativity, wide range of interests, human relation skills, oral communication skills, needs for advancement or achievement, resistance to stress, higher energy level and tolerance for uncertainty.

It is important to remember that these characteristics are considered normative and any one individual may well be gifted in leadership and not possess all of the traits or behaviors.

When the trait theory is the framework for planning and developing leadership programs, an individual profile based on personality inventories such as the California Personality Inventory, the Minnesota Multi-Phasic Inventory, the Myers-Briggs Type Indicators and the Edwards Personal Preference Schedule may be used. Information from these instruments can provide a multiple assessment profile to complement the trait history.

Leadership Style

When leadership style is used as a theoretical base for leadership program development, the classic types of leadership style are emphasized: 1) democratic, 2) Laissez-faire and 3) autocratic. Oftentimes behaviors in students that indicate democratic leadership that is autocratic, notably in athletics and social clubs, should also be included.

When the theoretical framework for gifted programs is leadership style, then a behavior oriented measurement is usually obtained by using informal and formal observational checklists. The Leader Behavior Description Questionnaire developed by Stogdill and Coons is an example of an instrument to assess leadership style and another attitudinal measurement is the Fundamental Interpersonal Relation Orientation-Behavior (FIRO-B): both are used in many leadership development programs. The FIRO-B is based on the notion that all human interaction is divided into three categories: inclusion, control and affection.

Situational Theory

Situational theory views leadership as developing in appropriately called for situations. An example of how situational theory can be used to plan and develop leadership is the Executive Internship program developed in the early 1970's by Sharlene Hirsch, and funded

by the now extant federal Office of the Gifted and Talented. The program has been replicated in over twenty-five states. In the Executive Intern program, students were placed with key decision makers in the arts, media, sciences, business, and in government. Students were able to experience leadership in real settings and develop mentor relationships with their placement sponsors.

The format for the executive intern program included four days on the job site in which students experienced organizational leadership with their individual mentors and a fifth day devoted to seminars for management, decision-making and administration. Hirsch utilized the Harvard Business School case study method and directed students to identify similarities and differences in observed leadership styles.

The identification procedure for the Executive Intern program included the gathering of a profile of information on each student's maturity, academics, past leadership accomplishment and teacher recommendations. In addition, each student and sponsor/mentor was interviewed and whenever possible students and mentors selected one another.

Another way to assess situational leadership is the Hersey and Blanchard Leader Effectiveness and Adaptability Description Questionnaire (LEAD) which assesses the individual's perception of his or her predominant leadership style in terms of task behavior and relationship behavior. Lastly, one can assess situational leadership by establishing small group situations and observing the interaction of individuals, and this subjective information can supplement the data from LEAD.

The Executive Intern program headquarters has been relocated in Orlando, Florida where many new programs are being initiated.

Leadership Program Commonalities

In reviewing various leadership programs (Passow, 1982; Parker, 1983; Gallagher, 1983; Feldhusen, 1986; Sisk & Shallcross, 1986) several program commonalities emerge. Most programs explore the meaning of leadership, examine leadership styles, encourage students to experience leadership, to become aware of their own strengths and weaknesses and to evaluate their potential as leaders.

Sisk and Shallcross (1986) report that in their examination of great leaders, leadership qualities fall into two categories, communication skills and problemsolving, and these qualities are applied in real-life situations.

Parker at Southwestern University in Louisiana identified four components in her leadership training model: cognition, interpersonal communication, problem solving and decision making. She defines cognition as going beyond facts to training in cognitive processes involving exploration of a variety of cognitive areas, and specialization resulting from exposure to a broad conceptual base and investigative skill training. Problem solving includes problem perception, definition, incubation, creative thinking, evaluation and implementation, and interpersonal communication includes self-realization, concern for others, cooperation and conflict resolution. Lastly, decision making is defined as including values clarification and active strategies such as role playing and simulation.

Leadership Training for the Future

Working with both educators of the gifted and students who are gifted, the staff of the CCIL have noted that some individuals are more gifted in predicting than others and that this capacity can be improved with training. Through specific training students and teachers can learn to predict and shape their future. To build on this phenomenon, the staff has developed leadership training with a futures component. As students manipulate present and past information, they learn to look backward and to look ahead, to develop forecasting skills to shape their lives. This notion is based on the psychological construct theory of Kelly who stressed that man has an active mind to shape life by predicting and testing hypotheses of probable and possible futures.

A Model Program for Developing Curriculum for Leadership

A model program for Developing Curriculum for Leadership was funded by the Turner Broadcasting System during the summer of 1985 and continued in 1986 and 1987 under states and private sponsorship. The CCIL planned, developed and field tested curriculum for students gifted in leadership. The model focused on: 1) selected

characteristics of students gifted in leadership, 2) selected strategies which had proved effective with students gifted in leadership, 3) selected teaching models, and 4) selected key concepts.

Gifted students possess unique characteristics and needs that cause them to behave in certain predictable patterns of behaviors and these patterns can become clues to ways teachers can plan to best meet their educational needs. Many teaching strategies become complementary to the characteristics of the gifted and many do not. In addition, the use of teaching models encourages teachers to plan for activities that include a variety of levels of thinking and behavior. Models such as the Guilford, Bloom, Renzulli and Taylor enable teachers to make a deliberate decision to develop learning experiences for specific talents or levels of thinking.

The last component of the model is that of key concepts. The use of key concepts has been stressed by any number of educators in gifted education including Kaplan (1974), Maker (1982), and Sisk (1987), and an early proponent of key concepts was Bruner (1960). Examples of key concepts include land as the basis of life, power, the need for celebration and creative expression and countless other broad themes or generic ideas.

The key concepts used in the summer leadership program in 1985, 1986 and 1987 are selected from the Portrait of America Series (Turner Broadcasting System). The series focuses on each state and territory in America through the words and deeds of its leaders, stressing the notion of man's interaction with the environment. The format used in planning curriculum is illustrated by the following lesson based on segment 1 of the Oklahoma tape. The interest stimulated by the tapes is expanded by using a variety of strategies and selected models. The following lesson is based on the Renzulli Enrichment Triad Model and focuses on the key concepts of values interacting with lifestyles, and the family.

STATE: *Oklahoma* (Segment #1)

MODEL: *Renzulli Enrichment Triad*

SUBJECT: *Social Studies*

KEY CONCEPTS: *Values Interacting with Lifestyle and the Family*

RESOURCES: *Videotape on Oklahoma, VCR and Television, Newspapers*

INSTRUCTIONAL OBJECTIVES: To have students focus on personal values.

To develop skills in making comparisons and value judgments.

To participate in the investigation of real life situations.
IDENTIFIED LEADERSHIP NEEDS AND/OR CHARACTER-
ISTICS:
*Independent, self-directed, wide range of interests, sensitive,
critical*
STRATEGIES . . . PROCEDURAL LESSON PLAN . . .
Self-Awareness Activity
Boundary Breakers:
(Enrichment I: Exploratory)

1. What trait do you most admire in an individual?

2. If you could live anywhere in this world, where would you
choose to live?

3. What would you like to be doing 15 years from now?

Tell students you are going to show them a videotape on Okla-
homa that focuses on lifestyles and the values of people who
have chosen a particular way of life. Ask them to consider
which lifestyle characteristics appeal to them.

Higher level
After viewing, discuss:
(Enrichment II: Thinking and feeling)

1. How does history effect the traits of a group of people?

2. Do you think there are significant differences between the
Oklahoman and the New Yorker or Floridian? Why?
(Divergent thinking and organization)

3. Why do you suppose the narrator says the meat cleaver shape
of Oklahoma is appropriate?
(Divergent thinking and organization)

4. What influences contribute to the character of an individual?

5. What do we mean when we say a particular experience "builds
character?"

6. Is it possible that some people actually lack character? Why?

7. How did the "Dust Bowl" of the mid-thirties and the Depres-
sion affect the character of the Oklahoman?

Ask students to contribute to a (Cognition list of characteristics
that and memory describe the Hitch family.
(Cognition and memory and responding.)

Ask students to contribute to list of characteristics that
describe the Parsons family.

Higher Level

In what ways are the Hitches and Parsons alike? In what ways are the Hitches and Parsons different?
(Convergent thinking and organization)

Have students write a paragraph comparing the lifestyles of the Hitch and Parsons families. In their comparisons they should write objectively with no value judgments about the lifestyles.
(Convergent production and organization)

FOLLOW UP ACTIVITY:

Now that you have learned to compare, you are ready to take the next step and make *value judgments*. Begin by formulating a value question.

Ex. *If I wanted to choose a lifestyle that would provide the greatest opportunity for achieving happiness and success, what characteristics would that lifestyle have?* List your criteria for a happy and successful lifestyle. Once you have established your criteria, judge any lifestyle against that criteria.
(Divergent thinking and characterization)

Group Dynamics

In small groups establish 8 criteria for a happy and successful life.
(Divergent prodution and characterization)

Now, in 15 minutes, arrive at a group decision. Next, judge the Hitch family and Parsons family lifestyles against this criteria. On the basis of the criteria, choose the lifestyle that would afford the greatest opportunity for happiness and success.
(Evaluation and characterization)

Share with the rest of the class your criteria for a happy and successful lifestyle and your value judgment of the two families' lifestyles.

EXTENDED OPTIONAL PROJECTS:

It is ten years from now and you close your eyes and visualize you are on your own.
(Enrichment III: Individual investigations of real problems)

Futuristics, Visualization

1. Write a one to two page paper describing your lifestyle. Include a description of your life's work, your standard of living, what you do for fun and relaxation, where you live, and your plans for the future.

Creative Problem Solving

2. Make up a budget to show how you spend your money. Document your expenditures with newspaper clippings. (You will have to pretend inflation has been controlled, and goods and services cost the same that they do today.) Include a menu for the week and a shopping list along with the costs. You will use these figures to estimate a monthly food bill. Display your clippings in some creative fashion.

EVALUATION PROCEDURES:

Comparisons are evaluated on the basis of format, content, and use of conventional language and mechanics.

Discussions and small group activities are evaluated on the basis of level of participation as observed by teacher.

Projects are evaluated on the basis of student's involvement (Did he/she really get into the assignment?), creativity, attention to detail, and use of conventional language and mechanics.

Fifty demonstration lessons were planned, developed and field tested in 1985 with elementary, middle school and high school students. These lessons and the theoretical framework for developing them are available from Turner Broadcasting System under the title *Children of Promise: Developing Leadership*, Turner Broadcasting Systems, Atlanta, Georgia.

In lessons such as "Today's Leaders" and "At Your Finger Tips" the content of lessons deals with issues and concepts related to the study of leadership. Once students become familiar with leadership theory, they can be encouraged to seek other class opportunities to apply their knowledge.

Today's Leaders

Characteristics: Questioning attitude, Independent, Achievers
Strategies: Higher Level Thinking, Higher Level Questioning

Model: Bloom's Cognitive Taxonomy
Key Concept: Leadership and Community Structure
Level: Secondary
Content Area: Language Arts, Drama
Boundary Breaker: What do you do for "Mental Stretching?"
Activity:

1. In examining some of the leaders in our society today, can you identify some of the pressures that surround them? (Knowledge) Which ones do you feel are the strongest pressures? Are any of these pressures ones which you have experienced?

2. What do you think is meant by the following statement: (Comprehension) "Even at its worst, leadership — frequently demanding, chaotic, frustrating, tiring, and unappreciated is never boring. For most leaders this escape from boredom is the ultimate fix" (David Campbell, 1985). Do you agree with this statement? (Evaluation)

3. What methods do you use to reduce the stress of a demanding and chaotic schedule? Which of these could you use later in life when stress begins to build up? (Application)

4. The following rules of thumb were given by financial expert Richard Hughes during a college lecture on negotiating:

> A. Do your research and be better informed than the people with whom you are dealing.
> B. Recognize that people have egos and give them acceptable reasons for switching to your viewpoint.
> C. Try to understand what is important to the other side by roleplaying their point of view.

In what ways could you apply these rules to situations in your life? (Application)

5. Use a copy of today's newspaper and identify 5 examples of people in leadership situations dealing with problems. Determine whether their actions are successful in defusing the problem. (Analysis)

6. Examine the list of leadership roles that have been identified by Henry Mitzberg in his studies of Chief Executive Officers.
Interpersonal Roles: Leader, Liaiason, Figurehead
Informational Roles: Monitor, Disseminator, Spokesperson
Decision Roles: Entrepreneur, Resource Allocator, Disturbance Handler, Negotiator

Circle the ones that you feel describe your current roles. Are any of the roles more important than others? (Evaluation) Describe a sit-

uation in your own future that might require a combination of these roles. (Analysis and Synthesis) Use your daily newspaper to identify examples of these roles.

7. Using the leaders identified from the newspaper, complete the following chart relying on past clippings and media pieces:

Name of Leader — Cause of Stress — Stress Relievers

Extenders:

Select a known method of stress reduction that is new to you and explore it in depth. Try using the method for a period of time and report on the results to your classmates.

At Your Fingertips

Characteristics: Wide Variety of Interest, Questioning Attitude, Decision Making, Serious Minded

Strategies: Self Awareness, Higher Level Questioning

Model: Renzulli's Enrichment Triad

Key Concept: Man's Need for Managing Information

Level: Secondary

Content Area: Language Arts

Boundary Breaker: In what field do you predict you might become a leader in the future?

Activity: Using your local public library or university library, identify the journals that you would probably be reading, the professional organizations which you would probably be joining, and the workshops that you would probably be attending in a career in your future. (Level One) From your investigation, share with your classmates the names of the various journals and organizations, the benefits and the costs, as well as some new information regarding your field. (Level Two) As a class, design a brochure listing the journals described by your classmates to share with teachers, parents, and professionals in order to start a collection of donated back issues. Maintain a section of a class bulletin board for current developments or items of interest that are described in the journals you are monitoring. Encourage your classmates to leave questions in an envelope on the board with enough time to research the answers. (Level Three)

Extenders:

Students may want to find out if there are professional meetings in the community that they can attend and share these experiences with their classmates. (Level One)

Students can be given a typical budget of a beginning pro-

fessional and asked to prioritize memberships and subscriptions to fit that budget. (Level Two)

At this point some of the students may benefit from mentorships and opportunities to work with leaders from various fields. (Level Three)

Leadership Training for the Future Program

The Centre for Creativity, Innovation and Leadership (CCIL) sponsors a two-week program for high school students from June 14-June 26 and for middle school students July 13-July 24. Criteria for eligibility include demonstrated leadership qualities by accomplishment, letters of recommendation and essays, and whenever feasible students can demonstrate interest in leadership development in a personal interview. This interview is not feasible when the students are from out of state or from out of the country: however the interview may be conducted on site by selected individuals.

The summer leadership program offers students opportunities to develop and use leadership skills to examine problems and issues resulting from technological growth. With recognized leaders from the University of South Florida and the greater Tampa Bay community, the students develop skills in three major strands: 1) leadership, 2) futures and 3) creative problem solving.

Specific suggestions that CCIL uses to enhance the effects of leadership training are:

1. develop an atmosphere in which students feel free to discuss and express themselves;

2. develop a sense of shared interests and problems and a climate of mutual respect and understanding among students in which each is willing to help and be helped by the others;

3. adapt the training program to meet the needs and interests of all students in a particular group;

4. develop a problemsolving orientation toward difficulties of leadership;

5. clarify the training goals, what students will accomplish through seminars, discussion and practice;

6. understand internal forces for and against change, also understand external forces for and against change; and

7. acquire and practice new skills which analysis of the leadership situation shows are most needed.

Students work and interact with resident counselors and teachers who have received prior training in the Centre for Creativity, Innovation and Leadership. Independent study and small group work are encouraged and the students are encouraged and the students receive personal counseling to develop their leadership abilities. The residential nature of the program facilitates peer interaction and serves to develop the individual student's leadership.

Student goals that they work to improve include the following:

1. being liked and respected by other students;
2. being able to influence others to work toward goals;
3. being able to influence others to be leaders;
4. being able to take charge of a group;
5. being able to judge the ability of others;
6. being able to solve problems and help others improve;
7. being looked up to by others;
8. being worthy of jobs;
9. being able to sense what others want and help them accomplish it;
10. being enthusiastic and able to accomplish goals.

The CCIL leadership program is based on the rationale that leadership in the future will require special skills appropriate to the technological trends and needs of society.

The Sisk model for curriculum development for leadership is used and curriculum content is developed cooperatively by teachers/-counselors/staff of the CCIL, and the students. Resource people from the community provide assistance to the staff, conduct seminars and serve as mentors to the students. Several instruments are used to evaluate the program such as the Scales for Rating Behavioral Characteristics of Superior Students (the Leadership Characteristics section) (Renzulli & Hartman, 1971) as a pre- and post-test measure, along with the Sisk Leadership Scale. In addition, the Loye (1983) inventory which examines students' attitudes toward the future, is administered as a pre- and post-test assessment to provide feedback on individual and group growth.

The leadership program has been funded through a number of souices, the State of Florida, the Turner Broadcasting System, and the Edyth Bush Charitable Foundation. The cost per student is $350.00 which includes housing and board on the campus of the University of South Florida where students live in suites, with four students sharing two rooms and a bath. The program is limited to 45

students for the two week period. Students who are interested can write to Dorothy Sisk, Director of the Centre for Creativity, Innovation and Leadership, Human Services Building, Room 469, University of South Florida, Tampa, Florida, 33620 or call (813) 974-3638 for more information.

Teachers who are interested in participating in the summer leadership training program can select among these courses offered during the four-week period including *Nature and Needs of the Gifted*, *Educational Strategies for the Gifted*, and *Guidance and Counseling of the Gifted*. Tuition is approximately $150.00 per course for the state of Florida residents and $600 for out of state/country. Interested teachers or counselors can also contact the CCIL.

The challenge for leadership development is here, the opportunity and time for action is now. Advocates for education of the gifted must step forward and become involved and committed in developing leadership in our students and in ourselves.

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Editor's Note: Those interested in other readings may obtain them from the authors.

Futurists, Tomorrow Minds, Artificial Hearts, and Other Life-Lengtheners

Futurific: Your Antidote
to Future Shock

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The future is not up for debate.

The future is the result of the activities of 5 billion human beings interacting with natural laws, and can be predicted with a high degree of accuracy.

Forecasters of the future practice an art form that uses scientific principles for a brush and statistics for paint. They are artists, because they look beyond the theorems and numbers for a deeper understanding and a human interpretation of their findings.

The Predictability of Life

The greatest hindrance to improving forecasting abilities is the overwhelming belief — even among people who call themselves futurists — that "of course you can't forecast the future, but . . ." This statement is so overused that most people haven't noticed that the "but" disqualifies the statement and makes it useless. In fact, we *can* forecast the future. Life is based on a very complicated but largely unconscious series of predictions that we take for granted. For example, when we wake up in the morning, we take for granted that the floor will hold us up, that breakfast will sustain us till lunch. If we could not make these predictions, we could not survive.

These predictions depend on the fact that life operates according to natural laws. For example, a basic law of physics states that every action will result in an equal and opposite reaction. This principle is reflected in economics as the law of supply and demand. When most of the public believes that the stock market will go up, it will react by going down. When the public panics and sells, the eager specialists and short-sellers absorb all the dumped shares and the market starts to rise again. Similarly, the oil shortage stimulates conservation of oil, the search for and discovery of alternative sources of energy, and increased exploration so that eventually a glut results. People usually ignore the power of these basic laws.

Another basic law is that no two objects can occupy the same space at the same time. Similarly, no two events can occupy the same moment in time. The stock market can go up or down or remain unchanged, but it cannot do all three at once. The United States will either come to terms of some kind with the Soviet Union, or it will not. We cannot be both at peace and at war at the same time. All futurists have to explore the possible alternatives to our future. This is the theorizing stage. But those who report only the possible alternatives leave their task unfinished. They are only offering alternative scenarios in the hope that one or another will hit the mark. They cannot forecast which of dozens will be accurate.

All education is basically the learning these laws of nature. We may learn about actions and reactions through informal life experience or through a formal science, which studies relations in the physical world or in society that are constant enough to enable us to predict the result of a given situation each time it is repeated. The role of the futurist will be vastly simplified when the public begins to recognize the operation of these laws.

Five Billion Conspiracies

Forecasting the future is like analyzing the work of an extremely complex, constantly running machine, made of 5 billion parts, each of which thinks and feels separately. The future may also be imagined as a great river composed of 5 billion molecules of water. Each part or molecule has a mind of its own. Some may act in unison for a common goal. Others may work against one another. Forecasters can also think of the future as the creation of the world's 5 billion inhabitants — each of them planning ahead — minutes, hours, days, years.

Most of them plan to improve their own or their family's lot in life. Many join cooperative ventures — social, economic, political, religious, or professional groups — and plan for the future of that venture and their future within it. The combined plans of all these billions of individuals work to create the future.

Some people, who have opposing goals, cancel out one another's plans. Some never reach their goals, and others go far beyond what they had hoped to achieve. So the future is not necessarily what each of us wants it to be; rather our plans are affected by the plans of others. Imagine everyone in the world playing at a huge tug-of-war. A small flag indicates the middle point where the 5 billion ropes converge. To forecast the future we have to track the flag as it moves over the midpoint between the contestants, not the individuals tugging in the ropes.

Forecasting the actions of an individual, while difficult, is possible. That is what social studies is all about. But forecasting the actions of a group, or better yet, a mob or a society is relatively easy.

As a rule of thumb, it is most important to realize that when a substantial amount of money or power changes hands, it is the result of carefully planned and executed action. Unplanned changes in the possession of money or power are the exception, not the rule.

Some plans fail to reach their objectives, and some may take a circuitous route to achieve them, but they are plans nonetheless. A statistical study of the past without a consideration of the plans in the works to solve problems or bring about a desired outcome is not enough to give us a correct forecast.

The Prophets of Our Era

Futurists are the prophets of our era. they have no other business than to refine their methods of forecasting to bring into sharper focus the view of life ahead.

The future *is*, and the role of the futurist is to identify what the future will be, not what it should or should not be. Manipulating findings to "predict" a certain outcome is fraudulent. Unfortunately, few people will pay for a forecast that does not agree with their own view or support their own plan. Most people hire forecasters to tell them what they want to hear. If they are paid to forecast an organization's progress, they tend just to pacify their employer with statistical confirmation of his or her preconceived notions.

The only way to have a good, that is, an accurate, forecast is to start with a forecaster who is not financially, emotionally or legally tied in with the results of the forecast. A true artist does not ask the public what it is willing to pay for, but completes a work to the best of his or her ability, offers it to the public, and hopes for a buyer. Similarly, a good forecaster does not use his or her predictions to ensure his or her financial survival.

Forecasting on order is as effective as digging for diamonds in a New York City sidewalk. As in diamond mining, forecasters must first find the proper site; the place where change is imminent. Unless forecasters look at places where the future is taking shape, they will not find the interactions of people and events that lead to a correct forecast. Next they have to sift through and eliminate irrelevant facts and unlikely scenarios. They must also eliminate from consideration the activities of people who are not initiating change but reacting to the actions of others. Also to be disregarded are minor events. Many tragic spots around the world, as sad as they are to the people involved, are not significant on a global scale. Only after we eliminate all the false leads can we concentrate on the few genuine leads, likely scenarios, and global events that will yield accurate predictions.

Forecasting is Big Business

Imagine driving down a road in a car with a blacked-out windshield and only a rear-view mirror to give you a clue to where you are going. That is what we have been doing, but we are beginning to realize that this rear-mirror approach to forecasting is no longer applicable in a society that is speeding down pitted highways at breakneck speeds. Governments, corporations, and individuals recognize the need for a correct view of the road ahead, correct not in terms of right or wrong, but in terms of accuracy. Thus forecasting is becoming big business.

Because so much forecasting depends on what the person hiring the forecaster wants to hear, misinformation is also big business. In some situations, consultants simply ignore unwelcome facts in order to please an employer. Magazines, newspapers, radio, and television are all involved in bringing forth ever more frequent news of the world, but the most significant facts are often hidden under mountains of information. Misinformation can also result from faulty techniques and data. The controversial report of the Club of Rome

on limits to economic growth misguided the world because it relied on simplistic modeling and incorrect statistics.

Another reason for the prevalence of misinformation is that there is so much money at stake. Unless people are "convinced" that the stock market will rise, they will not buy, while others must be "convinced" that the market will fall or they will not sell.

The most established method of forecasting is the Delphi method. The Delphi method is nothing but a survey of so-called experts in a given field, who, with their combined opinions, supposedly give a correct view of the road ahead. These experts, unfortunately, are political beings, who, just like the general public, have been carefully programmed by their political gurus and opinion makers to respond to a given question by rote. Some "experts" will reject everything that is endorsed by the Reagan administration, no matter how good. Others will endorse every idea from that quarter, no matter how bad. Some "experts" are optimists, others are pessimists, and most allow their feelings to color their view of the road ahead. Also, there are those who are good at forecasting and those who are not. The result is that a Delphi study suffers from the same faults as the average public opinion survey. It reflects all the ingrained biases of the particular industry with which the forecaster is allied, along with the general biases and "accepted truths" of the times.

Even if a forecast is accurate, if the forecast is too far afield from the well prepared and generally accepted view of the public, it will fall on deaf ears. No matter how right it is, the message will not sink in. The work of Herman Kahn, one of the most accurate futurists, was buried in criticism. The engineer who saw disaster ahead for the space shuttle was thought to be a troublemaker and was ignored. The Ethiopians who forecast economic and social disaster following the overthrow of Emperor Haile Selassie were drowned out or killed.

A Difficult Art

The future is like a river, ever moving forward. Any forecast must be "soft" because there is no static point. The past affects the future but does not necessarily determine it, so the accurate forecaster cannot simply look back at the past. Neither can he or she consider only one dimension of a situation or be a specialist. A good forecaster must be a generalist able to emphathize with all the participants. There is, therefore, no more difficult art than forecasting.

Consider for example, the future in relation to the Soviet Union. To understand the behavior of the Soviets, it is not important to study the shepherds on the steppes, but it is important to identify the key players in the power structure. But that alone is not enough; the forecaster has to observe people at the same level of power in all the nations whose behavior affects or is affected by the Soviets. Also important is an understanding of world economic and banking relations. The Soviet *glasnost* openness came close on the heels of the settlement with British banks regarding the czarist bonds. That is still not enough, for one must see internal economic forces at work and also the population growth rates of the different peoples within and outside the Soviet Union. Global changes in labor laws, sanitary conditions, technology, transportation, and communication all must be studied to obtain a clear idea of the direction the Soviets *will* take. None of the present developments are accidental—they are purposeful actions to change the world or reactions to change in the world. Although the present contest between the two great experiments—a market-driven economy and a centrally controlled economy—is resulting in victory for the market economy, neither one is pure and without an admixture of elements from the other, and such impurities must be considered.

Moreover, forecasters should be aware of the plans of key figures and must learn to evaluate their own possible effect on discovered plan, for a forecast can change the outcome of a plan and thus make the forecast invalid. Some forecasters purposely use this power to interfere with a plan and alter what they regard as an undesirable outcome. But if they use forecasting in this way, they are themselves participants in the plan or counterplan, and thus cannot be unbiased forecasters.

Statistics are important in understanding the future, of course, but forecasting requires more detective work than uncovering numbers. The pieces of the puzzle are all mixed up in a large box of statistics. There is no picture of the finished puzzle to guide one and often no colors to distinguish one piece from another. The difficulty of the task is best understood when we realize that the puzzle is four-dimensional. It was not meant to be assembled until the final moment when a plan is complete and can no longer be interfered with. Time adds the fourth dimension required to assemble the constant flow of pieces into a coherent picture.

Once the research is done and the pieces of the puzzle are assembled, the picture appears. Surprises are eliminated, and the road

ahead is clearly seen. *The resolution of the puzzle eliminates future shock, which is, after all, only the sudden appearance of the unexpected.*

Looking Ahead

Leaders in the United States recognize that we are living in a period of great change and must change our outlook accordingly. Former Secretary of State Cyrus R. Vance stated that "Most Americans now recognize that we alone cannot dictate events. This recognition is not a sign of America's decline. It is a sign of growing American maturity in a complex world." Zbigniew Brzezinski, President Jimmy Carter's assistant for national security, said that the "World is experiencing a global political awakening without precedent and at the same time undergoing a redistribution of economic and political power." Developing nations of the Third World have been and are being decontrolled and allowed to decide their own fate. They can play with a full hand in the card game known as the world marketplace.

Not since the founding of the United States have we seen such a magnificent human engineering project as the creation of a political and economic entity known as Europe, yet most people are not even aware of it. This single development, which is surely gaining momentum, will have the most profound impact on the future peaceful coexistence of the world powers. The development of such a world power, superseding the nations of Europe, with the cooperation of the other great powers is unprecedented. Indeed, borders in many places are disappearing and countries are reuniting. After years of political and military strife, Vietnam is a unified country. North and South Korea will also be reunited as well as East and West Germany, with the difference being that Germany will then exist as a part of a larger Europe. Colonial boundaries in Africa are being adjusted to match the interests of the present majority of inhabitants.

In addition to European nations, other large groups of nations are forming economic units to pool their resources to allow them to play a more important role in international trade. Canada, the United States, and Mexico; the Southeast Asian countries; and even Latin American, Middle Eastern and African nations are moving in this direction. Most people, however, are so occupied with looking at particular problems that they do not see the larger picture. They notice localized wars, yet more people are living in peace with one

another than ever before. Most Americans cry about health costs, yet life expectancy has never been so high. They blame the government for unemployment, yet never have so many people had jobs. They worry about relatively small trade imbalances, while the overall amount of trade expands at a phenomenal rate.

People basically see what they want to see, but that does not change the reality of the future. Just as the tree falling in a forest makes the air vibrate regardless of whether there is someone whose ear perceives the vibration as noise, so the reality of the future exists even if there is non one present to observe it.

A Forecast for Poland

Let us review why FUTURIFIC magazine was so successful in forecasting the future of Poland, the fulcrum for East/West relations, while others were so far off the mark.

Winston Churchill once said that government's role is deciding how much of the future to allow. In Poland the government is certainly measuring out the future with a teaspoon, but change is nevertheless taking place. When we reported on Poland's future, we focused on the key people involved like Wojciech Jaruzelski, Yuri V. Andropov, Ronald Reagan, Pope John Paul, and certain international bankers. Poland's future has first taken form in these men's minds.

Once the government decided how much of the future to allow, the public and the press did no more than react to that decision. The improvement in Poland's situation, beginning in 1981 occurred because Jaruzelski, with the aid of the bankers, the tolerance of Andropov, and the support of Reagan and the Pope, instituted a new liberalization that permitted more individual liberty. The press gained more latitude to debate internal issues, although its union was disbanded. The legal system began to redress wrongs, although it has a long way to go. A multiparty system began to develop. The Communist Party lost members and status. Thousands of its members were charged with corruption and dropped from positions of patronage.

In encouraging liberalization, Jaruzelski also made the Polish economy more efficient, better managed, and less corrupt. It was rebuilt according to a market-driven model designed by the 148 member nations of the International Monetary Fund (IMF). Fac-

tories that were a financial drain on the government were closed. Many companies were granted the privilege of self-management. In a denationalization program, individuals were encouraged to take over ownership of money-losing enterprises from the government. Three and a half million farmers now own 50 percent of the arable land.

Thus the government gained the approval of the IMF, which loaned Poland large sums of money (in comparison with other East Bloc nations).

Before the decade is out, Poland will show economic strength undreamed of by most observers. Western banks rescheduled Poland's debt, under IMF supervision, helping Poland compete again in the international marketplace. Poland will eventually become a member of the European Common Market and will gradually strengthen its ties to an ever healthier world economy that is based on solid economic foundations instead of political considerations.

Since revolutions and bloodshed usually do not occur when oppression is greatest but when control is relaxed and dissent runs rampant, Jaruzelski has been careful to keep these changes under control. He declared martial law in 1981 because experience in Hungary, Czechoslovakia, and earlier in Poland showed that people used to the classic Communist system's cradle-to-grave care would not easily accept the rigors of the market system, even if it, in the long run, meant greater freedom. The action of the government was well planned. Troops were trained for crowd control and martial law announcements were printed in advance in the Soviet Union. There is no evidence that anyone was mistreated, although accidental clashes did occur. No death sentences were imposed. Food shortages were reported, but there were no complaints of hunger.

Martial law also discouraged a possible Soviet invasion. Although Poland could not match a surprise Soviet attack, its mobilized forces were a deterrent. The CIA reported that the Soviets would have needed 40 divisions to suppress a fully mobilized Poland; only 27 were available.

FUTURIFIC magazine further realized the close connection between developments in Poland and those in the Soviet Union.

Andropov's role in the liberalization process was to do nothing. That is, to make sure that nothing happened to upset the Polish test case—which after all is his "dress rehearsal" for the eventual economic conversion of the Soviet Union, which Andropov wanted

to achieve without bloodshed. By this time it was obvious that the Russian Revolution was over and it was time to get down to the business of life. Andropov knew this. He had seen it in Hungary. If the Polish test was successful, possibly the Soviet Union could do the same. That was and is the only hope for the Soviet Union, whose internal problems are so immense that only a radical transformation can save it.

The Pope's role, as a guest of the Polish government in 1983, was to serve the needs of his host (i.e. to pacify the people). He was the channel through which they poured out their last optimistic passion before getting down to the work of rebuilding their economy.

President Reagan, in continuing to maintain economic sanctions against Poland, helped it avoid continued expansion of its debt. He also served as a scapegoat for Jaruzelski to blame for the closed factories. Cancelling LOT's landing rights in New York saved money for Poland by eliminating a money losing run for the airline. Not allowing Polish boats to fish in U.S. waters made them fish closer to home, thus saving costly fuel. In the meantime, the U.S. government guaranteed payments of interest on the Polish debt.

In the light of these developments, the tension between East and West over Poland seemed manufactured. When we looked at the dollar value of trade between the Soviet Union and the United States, the chart was very smooth; we could not see where the Polish "crisis" started. Futurists realize that the battle is not between conflicting political systems but between efficiency versus inefficiency.

In 1981 FUTURIFIC magazine declared: "Poland: A Dress Rehearsal for Russia" — and the times have proved it right.

A Futurist's View

I am a futurist. As founder and editor of the 13-year-old, not-for-profit monthly magazine called FUTURIFIC, I strive to see trends and relationships in human affairs before other do. I focus on perceiving life ahead, refining the methodology of forecasting, increasing accuracy, and presenting my findings to interest people.

FUTURIFIC is the only journal that presents the world not as we would like it to be but the way it *will be*. As much as possible, it provides an unbiased approach to examining people, places, things, ideas, and motives as they were in the past and as they are today. It researches in depth and extrapolates from current knowledge for the purpose of forecasting the future. Its scope is unlimited.

As editors and writers we are realists. We know that forecasting the future is possible through scientific methods and attention to detail. We look at all sides of an issue—projecting, extending, and expanding the results in order to furnish our readers with guidance. We never give conflicting reports, always striving to identify a clear path. FUTURIFIC is reporting from the frontiers of human development, providing readers with a strong antidote to future shock. We do not strive to change the world with our insights, but to provide a tool for our readers to use as they see fit. FUTURIFIC is the foundation for optimism.

Strengthening Life-Lengthening by Businesses and by Students Who Continually Innovate

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In Search of Excellence brought instant success to authors Peters and Watterman (1982). In the beginning of their book, they provided a litany of unusual efforts on the part of average employees, of *product champions who believe so strongly in their ideas that they take it on themselves to damn the bureaucracy and maneuver their projects through the organization and out to the customer*. They tell about little teams of people going to extraordinary lengths to get results, and of small competitive bands of *ingenious people inventing new products and new processes*. They concluded that quality and service were the hallmarks of these top performing companies. Excellent companies demand excellent performance from every employee. Intensity of effort is another attribute of the entire corporation as is also their ability to manage ambiguity and paradox.

Many readers probably missed a critical feature of Peters and Waterman's work — *they defined excellence as "continuously innovative". Continuously creating new products and processes obviously distinguishes those who produce for the future* from those who produce for the present.

Organizations who constantly search for new ways to solve problems. who constantly come up with new products and new processes,

are *the ones that contribute most to progress in the world.* Only when a company relaxes and "coasts" on its good market position with a once-fine-product will it end up selling off plants and equipment in an effort to generate cash and stay alive. The list of companies that sat still without improving their electromechanical products, but only watched electronics come to the front, is both long and sad. In contrast, *viable organizations* are able to *continually sustain the creative efforts with which they started*—and this can be true of people, too.

Let me illustrate the problems. "On December 7th, 1941, an enemy of the United States killed about 2800 human beings. Yesterday in America, we killed 4000 individuals! Today we will kill 4000! And, tomorrow, we will kill another 4000!" This statement was made by Mr. Bradford Butler, retired Chairman of Proctor & Gamble. This mass murder happens when children who are ill-prepared for school get thrown into an environment unsuited to whatever talents and skills they have working for them. They rebel and end up "on the street", eventually costing everyone huge amounts of money.

At the same time, in another way, severe damage is probably done to about 3.5 million people each year. This group represents the number of new hires each year whose talents are not identified or are not being developed—or who are not given the opportunity to exercise the talents that they already have available working for them. They become disenchanted with a job and then separate from that job either physically or psychologically. They look for a new job, or become discontented at best. The loss to America is staggering from such turnover or malfunctioning on the job. The turmoil in the world today is compelling evidence that we need to capture and maximize the talents of all our people, especially the young ones.

Most of the research conducted by our organization indicates that a company can expect gains of about 25% in productivity from test selected employees over and above non-test selected workers. John Hunter (1983) showed that if all companies that were using the GATB tests of the *U*nited *S*tates *E*mployment *S*ervices (USES) had used them properly, the savings for that total group of companies at that time would be over 80 billion dollars. Think of it! *Our national debt could be erased in a couple of decades or less just by proper selection and development of people.* This would be true not only if the above group of companies but also many other organizations in our nation, were using all of the up-to-date scientifically-best talent test-

ing and talent teaching methods. (Editor's note from Walter Talbot: *And the people so well selected-and-developed into functioning very effectively would never let the nation get into debt again!*)

It has been said that without imagination and creativity, a country cannot survive. Creativity is not for a chosen few, but could be for all those who choose to try. Furthermore, since there are multiple talent components in creativity, there must be a vast untapped talent pool available to us if we simply look for talents in that total talent pool and then put them to good use.

The problem for business is simply that when we go to look for those huge resources, we cannot identify them from school records, and sometimes not from work records. Recent graduates know their academic standing, and everyone is aware of the importance of grade point average when staying in the school system and wanting to pass to the next higher grade. But academic talent is not creativity, nor decision-making, nor any of the other seven talents in the multiple talent totem poles. Academic talent has little to do with success in later life, while creative talents and leadership talents and other human relationship talents show a nice relationship to success in a career. Unless business uses some special tests, they cannot systematically tap these hidden resources. Without such talent information, they have to trust to luck. That makes staffing chancey.

The real value of proper selection of job applicants has never been fully appreciated. Our organization, *H*uman *R*esources *I*nternational (HRI), has long offered selection testing to all of the 80 Pella Window distributors in the U.S. We serve only about 10 percent of the total of such organizations and have helped select only slightly more than 10 percent of all salesmen. But, in the group receiving awards for excellence in sales effort, our selectees represent 83 percent of the total.

An informal survey among a small group of companies in Ohio showed that few if any are known to use selection tests of creative ability. Some consulting organizations probably have something a little bit like these tests available for their clients. But, obviously, business is not capitalizing on opportunities available to them, for there are many useful tests *to help predict who could be continuously innovative.*

HRI has always tested for creative talents as a part of our regular screening and assessment processes. Summarizing what we find as our "ideal" employee, regardless of the particular job or the organi-

zation, yields a picture of someone quite like L.M. Terman's description of *the non-intellectual qualities of creative people*—namely Initiative, enthusiasm, industry, reliability, better relations with school mates, less anxiety, independence, non-conforming behavior, confidence, etc.

At HRI, we have tests that can measure each one of these qualities independently. We have built tests that measure the creative aptitudes of fluency of ideas as well as problem recognition ability. Finally, in addition to the above, we measure intellectual curiosity and leadership. We have found that *the top managers whose companies produce for the future have exactly these qualities—as do their companies.*

The University of Utah has developed over many years, selection instruments that identify reliably and with predictability, people who have leadership skills, are creative, have artistic talents, and are high academically. Problems are introduced when these four are known to be separate, and that success in one does not show any real pattern of relationships to success in the other. With such selection techniques, however, one can find multiple talented people who are good in more than one area.

The problem in industry is to locate and employ people who have the creative talents necessary and can contribute to the sustained growth and life-lengthening of an employer's organization. The problem of a consultant providing management with human resource services is the same—it is critical to be able to identify the talented individual in the first place.

Business has no way to look at recent graduates and tell if they are good leaders, if they have creative talents, or if they have learned the human relations talents so necessary in business. School grades indicate only academic success—a small part of the selection problem. In fact, the multiple talented students often feel bottled up in school, and they may end up leaving early without having had the opportunity to discover and show their talents.

The goal of most recent graduates is expressed as "to get a good education and prepare oneself for the 'real world'." It is very apparent that many of them sense that academic success does not assure occupational success. Thus the need for schooling in leadership, human relations, and other areas, such as *continuously innovating and creating new products and processes*, is felt by many. Students lose confidence when turned out of school without practical experi-

ence and with little feelings of being able to function more fully and effectively. They can pass knowledge tests, but they cannot get along well with their peers. They know about contingency leadership, but cannot plan a set of tasks that involves a group and a goal with a time table.

Managers at IBM are being exposed to the leadership process by watching the full length movie, Twelve O'Clock High. They must analyze the leadership style of Gregory Peck and five other officers. Their analysis is compared with the consensus of military experts. What could educators do along similar lines? Why should anyone wait till recent graduates are out for 10 years before this kind of exercise is a required learning?

Leadership has to be taught with a hands-on and brains-on approach. Let students interview other students and then make judgments about the attributes of the interviewee. Have well developed standards as criteria against which to evaluate performance. Teaching electricity to youngsters is promoted by a hands on approach, using light bulbs, one cell batteries, and so on.

Managers, and everyone, in fact, have to be able to appreciate what talents an individual might possess. They then have to be able to utilize those talents to full advantage and thereby maximize the development and utilization of individual's potentials.

The biggest problem for educators in today's school will be in trying to teach students "non-conformity" as an attribute of creativity that is non-intellectual. How do you teach non-conformity in a system that runs on rules — on conformity? And teaching a student how to be demanding and tough is anathema to most professors. The skilled manager in continuously innovative organizations has a real sense for encouraging non-conformity without losing control, and also knows just how demanding he can be without causing unwanted side effects, such as turnover among valued employees. It is the teaching of new types of knowledge and methods that is strange for educators.

Problems still remain. Cleveland area schools are discontinuing "pull out" programs for G/T students for lack of funding by the state. A fine Cleveland suburb is just now beginning to address the problem of creativity in its high school. And, so far as is known, only a handful of businesses have ever tried to identify gifted and talented people using creativity tests. Teachers at my conference speech volunteered that there seem to be few school systems organized to discover students' real talents and to nurture them.

America is not capitalizing on what we really could now achieve. Other countries, I presume, are equally slow to utilize the latest state-of-the-art approaches.

In summary, the challenge of wisely staffing a business organization involves the measurement of multiple talents, the prediction of success, and the placement of individuals into positions that enable these multiple talents to be useful. Businesses can easily identify the academically talented student, but cannot look to school records to determine if the student has creative ability, leadership skills, or human relations skills —all of which are different from academic aptitude, but all are essential in business.

Success is more a function of motivation and leadership than of the ability to pass knowledge tests. Schools have to take a stronger position in teaching these essential abilities, and in capitalizing on creative imagination found in many students. All students are strong in one or more talents and our responsibility is to identify them and to maximize the understanding and development of their potentials. Businesses that are wanting to be ahead in producing for the future should find, develop, and utilize these talented students fully by having them *help the businesses become increasingly effective in continuously innovating and creating new processes and new products.*

Current planning for many school systems in the U. S. emphasizes math and science in an effort to regain lost ground to high technology productivity in other countries. Since creative scientific talent could come from all segments of the academic spectrum, these schools are overlooking a great talent pool. They move, regretably, on a path whose manifest destiny, except in academics, is mediocrity. Many schools need to do almost a *180 degree turn and focus on creativity, leadership, and other talents* as well as academics. We have systems for early identification of multiple talents as well as curricula designed to maximize the development of these talents. *There is a compelling need to implement these available, up-to-date programs now if we are to make the businesses and industries and their workers, in our country as well as in other countries, become continuously innovative and creative.*

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From Future Shock to Futures Possibilities for Gifted and Talented Students

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Johannesburg, South Africa 2050

Education for the future faces a dilemma: we are preparing students for something that does not yet exist, yet if we do not get students to contemplate the future as realistically as possible, they will see the future as something over which they have no control — a fearful unknown. If our gifted and talented students are to contribute to social and cultural evolution, a sense of their power to effect change is crucial to our survival.

Experiencing Future Shock. According to Toffler (1970), a victim of future shock has his senses continually bombarded, is subjected to an overload of information, and is under constant pressure to make decisions, which force him to operate beyond his ability to adapt. He is bewildered by constant change in the social, technological and physical environment. A recent national survey of American children's visions of the future (sample of about 140,000 students of all ages) showed that they are fearful about the future of both the U.S.A. and the world (Johnson, 1987). Despite this, these students were positive about their own personal futures — and about overcoming cultural and racial barriers. In all these concerns is the notion that the future is predetermined and we are mere victims helpless to prevent disaster — a "doomsday" view of fate.

Developing a Futures Perspective. In contrast, the view that we are constantly creating the future, by the choices we make in the present, frees the individual from being a victim of fate — we are instruments of change. Courses in futuristics have this as their aim:

> "Futuristics is the systematic study by basically rational or empirical means of the possible alternative futures of human societies and the special problems and opportunities relating to those futures" (Kaufman, 1976,p.232).

Components of a Futures Curriculum

1. Interdisciplinary Trend Analysis.

In the real world, problems do not come in discrete content areas and with the constant growth of knowledge in an information environment, the content-based curriculum becomes redundant. Content should be centered around trends — observable regularities or patterns that emerge in the social and physical world through forecasting. Trends can be grouped into three areas: technological (electronics, communications, robotics, computerization); biological (genetic engineering); and sociological (population, resources, relationships). The essence is multidisciplinary and problem-centered (a method used in the Purdue Three-Stage Enrichment Model (Feldhusen and Kolloff,1978).

2. Skills of Forecasting the Future.

The many skills that have been identified as relevant for forecasting the future are currently in use in gifted education — in particular, simulations and scenarios. The central objective of forecasting is to understand change and develop ideas of alternative futures. Taylor's Multiple Talents Model includes forecasting, defined as "To make a variety of predictions about the possible causes and/or effects of various phenomena". (See the last section on Forecasting Skills.)

3. Experience of Being a Creative Producer

If students are to develop a sense of power to effect change and have an impact on the world, they need to investigate real problems. They need to learn the specific methodologies used in the real world and then put these into action in solving problems for real audiences. in the Schoolwide Enrichment Model (Renaulli and Reis, 1986) students can explore interdisciplinary trends ("Type I activities"); can practice methodological and thinking skills, including forecasting ("Type II activities"); and can complete independent investigations

of real problems into creative productivity ("Type III activities").

4. An Active Self — Master of Fate.

A perception that one is a victim of circumstances controlled by external forces (grades, authorities, rewards, forces, fate) induces futures shock. A perception that one is master of one's fate, a productive creator of changing circumstances, implies internal self-control. The Integrated Education Model (Clark, 1986) is concerned with developing an internal locus of control, that the human functions of thinking, feeling, sensation and intuition are integrated in a "brain compatible curriculum". In a discussion of the "forecasting brain", Loye, 1984, states:

> "Which would be the best forecaster? Obviously the thinker. However, the very best forecasting would not be done by any "pure" type. Rather, it would be done by an intuiting-thinking-feeling-and sensing individual, or by a group containing the right mix of such kinds of minds." (p. 67)

Types of Programmes in Action

Options for programming could include:

— *Skill Training* in techniques of forecasting, decision-making (such as Talents Unlimited Programme).
— *Mini-Courses* in future studies (such as Milford Futurology).
— *Integrating* forecasting techniques into specific subject areas.
— *Problem-Solving Programs* such as the Future Problem-Solving Programme which aims to develop teamwork, enlargement and enrichment of images of the future and interdisciplinary thinking in an interscholastic international Bowl Torrance, 1979).
— *Intensive Vacation Schools* that include the components above, (such as the "Futuristic School" below).
— *Networks of Students* negotiating future problems (such as the "Futurenex" programme below).
— *Correspondence* with clubs and societies concerning the future (such as the World Future Society).

Complete Curriculum in Futuristics

1. The Futuristic School.

This is an intensive vacation school within the context of a comprehensive programme for gifted, talented and creative students (from an option of over 60 enrichment, acceleration and skill-based

courses offer annually by the Schmerenbeck Educational Center, University of the Witwatergrand, South Africa). This programme integrates the scenario with problem-solving, trend analysis, creative productivity and an environment conductive to an internal locus of control and intuitive responses. To facilitate trend exploration, content covers 6 areas: technology; the physical environment; the natural environment; the built environment; anatomy and the mind; and self and society. The trends are explored in special sessions daily with visits to research units (Nuclear Physics, Personnel Research, Medical Research, Electricity Supply Commission, etc.) Co-ordinators assist with several daily problem-solving sessions allowing students to develop skills, forecast possible futures, and generate ideas for creative products. Student products include inventions, reports, dramatic presentations, video production—ways that the students communicate their findings to the group. Students evaluate their own development formatively in the context of the programme, and also their own products. Qualitative evaluations (records and observations) of the programme has shown its effectiveness in developing a futures perspective. Further information is needed on the long-term impact of such a programme plus the transfer of skills.

2. Forecasting Network of Students.

This programme, *"Futurenex"*, is a network of students who forecast possible futures. The Network Communications Center is located at the Schmerenbeck Educational Center. On a self-study basis, students are trained in use of the forecasting skills while being exposed to current trends about a range of topics relevant to possible futures (Stage One). They then develop speculative questions which are circulated within the network, and using a problem-solving strategy, they complete activities generated by other students (Stage Two). They are then paired with another student (contact either personally, telephonically, electronically or by mail) and negotiate strategies for solving problems and develop their own investigations (Stage Three) into creative products for real audiences (Stage Four). At each stage activities are completed and feedback is given both to the participant and the whole network. Research is currently evaluating Futurenex.

As stated in the orientation booklet, the aims of the programme may be seen as objectives of all education for the future: "The purpose of *Futurenex* as a learning programme is to:

— set up a network of students for real problem-solving
— train you in thinking skills for forecasting the future
— get you to be positive about your own ideas and actions
— get you to use all the information sources around you
— make you independent and responsible for your own learning
— help you to judge your own progress
— teach you how to solve problems in the real world
— help you to speculate about what futures are possible
— develop an image of the future that is enriched and accurate.'

(Eriksson, 1987,p.3)

Skills for Forecasting the Future

1. Trend Extrapolation.
On the basis of prior occurrence predictions of future changes are made assuming variables will continue.

2. Systems Analysis.
This examines an entire system by gathering data to identify its component parts; understand how it all functions; forecast possible occurrences due to changing circumstances. (Such as a transport system; the circulatory system; waste disposal system.)

3. Simulations.
On the basis on information about how a model operates, simulations allow the student to role-play being in the situation itself. Experimentation and exploration of ideas, alternative choices of action, and consequences of such action can be experimented without real dangers. Elements of the real situation should be present so that choices have relevance to the real world and skills carry over into real actions. (Such as simulating the operation of a small coastal village under the threat of urban development.)

4. Cross-Impact Matrix.
This takes any topic or problem and identifies the many forces operating on it that must be considered. Having listed these vertically and repeated major areas horizontally, thereby forming a matrix, the interaction/impact of one force on another can be studied. (Such as designing a house: rooms; services; functions; heating; light; interior decor; access; etc.)

5. Future's Wheel.
At the center on a large page is placed the trend or problem or change (such as "increasing slums", "wasted resources", "disused

transport'', ''health hazards'', ''crowding of the suburbs''). Each of these spokes can then form the center of another futures wheel with further alternative consequences.

6. Decision Tree. A decision tree examines alternatives in the exploring of a problem in terms of yes/no responses. The tree continues to expand from each yes statement, pointing to further choices resulting from previous ones.

e.g. Vacation? Yes: Away? Yes. Inland? No. Coastal? Yes. Camping? No. Boat house? Yes.

7. Delphi Technique.
This is a technique of obtaining group opinion and the consensus of experts in a field on possible trends and consequences, without personalities influencing the outcomes. It is conducted anonymously in 4 ''rounds'' conducted through the mail by questionnaire:

a: What is expected to happen? List alternatives.

b: When will each alternative happen? Is this desirable?

c: Average responses of all participants are given, and where respondents deviate from this, they are asked to clarify/justify their ideas.

d: Refinement where respondents were asked to evaluate differing opinions where a consensus has not been reached. Multiple possibilities are identified.

This technique differs form an opinion poll in that ''experts'' are the participants and the aim is to reach consensus about alternatives possible futures within a specified area of exploration.

8. Future Scenarios.
This involves students in writing a story, play or description of the future at a projected moment in time, with the view to describing the changes that have already taken place to reach that time. The vision of a possible future are clarified with consequences. (Such as ''You wake up from a daydream in the year 2020. You have been drifting off during an important assignment at work. You begin to review your own abilities, how you came to be in this important position. Describe your thoughts and the nature of your mission.'')

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Editor's note: My reference has been added for being the only psychologist on the program in this three-conference Air Force sponsored series on long range planning and forecasting. For a quarter of a century we have had forecasting and planning as two of the first six talents and now, two of the nine talents in our talent totem-poles. Copies of my forecasting chapter in that conference are available in my office.

Views of the Future:
Gifted Versus Nongifted Youths

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"Previously, men studied the past to shed light on the present, I have turned the time-mirror around, convinced that a coherent image of the future can also shower us with valuable insights into today."
Alvin Toffler, *Future Shock*, 1970

We live the present within the context of our future image (Plante, 1975) and inescapably, tomorrow's world is being shaped by today's decisions (Whaley, 1984) — decisions that could either limit or enlarge the resources and the possibilities for survival.

Axiomatically, our present-day society is ill-prepared for the future. Its systems of education are unequal to the task of assisting the young to cope successfully with the ever-increasing and changing complex problems of the future. Michael (1968) asserts that this stems from an educational system which has always reflected the values of the past. He advocates that teachers discard their passive, impartial, neutral roles and provide students with a plurality of viewpoints. The major problem Glines (1980) adds has been that schools have focused on efficiency; educators have not been educators but have been schoolmen and schoolwomen. Learning must be equated with the study of societal problems and possibilities (Theobald,

1968). Going one step further, Fuller (1968) indicates in *Utopia or Oblivion* that the way to survival is to take the responsibility for one's future. To leave the important decisions for others to make is tantamount to the choice for oblivion. Each person must become a futurist, and must take part in creating a desired future for society (Glines, 1980). The creation of the future is a possibility that requires knowledge, imagination and perseverance (Theobald, 1948). Our inescapable task, therefore, is to radically change the means by which people are being educated and what they are learning. One of the first measures to take to accomplish this effectively is by gauging the pulse of where our students are at in terms of their present visions of the future.

This particular investigation was undertaken to determine the views of the future by adolescents and to look into some factors that may influence them. Specifically, it is a comparative study of gifted and nongifted male and female adolescents' images of their own future and their conception of the future of their country (Canada) and the world to ascertain the extent to which they are able to see the relationships between their own lives and events in the rest of the world. This could provide us some guidelines in terms of how we may be able to assist young people perceive and deal with the present to shape a better and more preferable future.

METHOD

Subjects (N = 1339) consist of 666 gifted (males = 335; females = 331) and 673 nongifted (males = 317; females = 356) adolescents who are attending grades 9 to 12 in nine different secondary schools. Gifted I (N = 225) attends a special urban school for the academically gifted (selected on the basis of academic achievement and verbal and mathematical skills reflected in their special entrance examination and personal interview); Gifted II (N = 411) attends three urban secondary schools that offer special classes for the gifted (selected on the basis of intellectual achievement, creativity and task commitment); Nongifted I (N = 432) attends two urban secondary schools; and Nongifted II (N = 241) attends three nonurban secondary schools. They filled out anonymously Johnson and Wagschal's 47-item questionnaire, *The Future*, (1986) which was modified slightly to fit the Canadian scene (e.g. President was changed to Prime Minister; state was changed to province; and the like). The survey was

divided into three categories of questions: the students' own future in Canada, the future of Canada, and the future of the world. The future was defined: "when you are as old as your parents are now."

Item responses were tabulated, translated into percentages and sometimes into ranks as well, and presented in tables to compare subjects by grades and sex within each group between the gifted and nongifted groups. The two kinds of special schools for the gifted were initially compared to determine the particular impact of the course on thinking that the special school provides to its students; the two groups of nongifted students were compared to determine the possible influence of urban versus nonurban living on their visions of the future. Preliminary data analysis showed no particular consistent and/or substantial differences across grade levels and between subgroups within each group. For this reason, data were consolidated into two groups (gifted and nongifted) of males and females for more convenient comparative analysis.

FINDINGS AND DISCUSSION

What emerges quite clearly in this investigation is the overwhelming similarity of the future visions of gifted and nongifted adolescents regardless of sex. As a whole, the subjects expect to live in paradise amidst hell. While they envision a very bright future for themselves, inversely, they view a dark scenario unfolding for their country and the rest of the world, with the exception of some evidence on changing sex roles; better race relations; cure for cancer; commonality of replacement of human organs; and ease of international travel. The vast discrepancy between subjects' images of their personal futures and their conception of the larger society within which they will live out their individual futures is a shocking finding but not an entirely surprising one. Wagschal and Johnson (1986) consistently found in years of study that there is no relationship between these two views of the future of students of different ages (from elementary to postsecondary schools). Students' future views, in their studies, range from the most pessimistic projections of environmental degradation to the most technologically optimistic fantasies of a computerized utopia. However, when it comes to their personal futures, their expectations tend to be generally conservative and optimistic, bearing no relationship to the larger futures they have predicted. Contrary to expectation, in this investigation the gifted follow a similar pattern of

predictions as the nongifted; the difference noted on some items is merely in degree not in direction.

The youths' expectations and preferences of things to happen in the future in Canada and in the world appear very sensible and realistic (quite close to those shared by the gifted in the 1983 international study conducted by Torrance) — a far cry from their expectations for their own personal futures which look fantasy-filled and unreasonable vis a vis their predictions on the larger society. On the other hand, they appeared unable to see the relationship between the impact of their own decisions on their personal lives and the impact of the decisions of government leaders and others on larger issues. A striking majority predicts that their own choices will be most important in deciding their own future lives, while at the same time a substantial proportion feel that choices made by others, particularly government leaders, will be most important in deciding what Canada and the world will be like in the future. Evidently, the subjects separate events, issues, and problems on a global level from their personal futures implying that their personal world is impenetrable and invulnerable to the events surrounding it. This lack of sense of interrelatedness of large-scale events and one's own personal life may be attributed more to affective rather than cognitive dysfunction considering that the young children and the adults in Wagschal and Johnson's studies as well as the gifted and the nongifted adolescents in this study tend to respond in similar manner. Further, the thinking course taken by one group of gifted did not seem to show any significant impact on their responses in comparison with the other gifted group that had not undergone the same enriched experience.

It appears logical to conclude that the failure to see the relationships between world and personal events is *not so much because they can't as much as because they won't* (unconsciously). It is much less anxiety-arousing to make gloomy predictions about others than about oneself as Wagschal and Johnson had also emphasized. To be able to carry on the normal activities in life, it seems necessary to don the robe of omnipotence — a feeling of indestructibility, an immunity or invulnerability to catastrophes — an in-built mental health mechanism to keep people venturing and daring. This may be associated with a kind of egocentrism in which the person believes himself/herself to be the centre of the universe — the special person who could defy injuries, illness, aging and even death. We see the dynamics of such psychological phenomenon in full force during child-

hood and adolescence and somewhat even during adulthood. We also note its operation among physicians who unconsciously believe their immunity to disease: the belief that it can't happen to them, the omnipotent healer. Sometimes the denial is carried on right in the face of contrary reality. This defense mechanism is usually toned down as we come closer to mortality in much later age.

The crucial question is: How can we provide youths with ways and means of coping constructively and productively with the present and the future within a wide range of possibilities? A natural and logical implication for education is the inclusion and / or the integration of future studies in the school curriculum.

It is strongly advocated here that such futures studies should consider far more seriously than was afforded in the past the development of the affective domain.

Considering that a person's educational and social development is heavily contingent upon his/her "fugure-focused role-image" (Singer, 1974), it is vital that such projected image of oneself into the future be perceived positively and clearly. Whatever, however, and whenever we embark on future studies with children, youth and adults it may be fruitful to consider what Tan-Willman (1977) had proposed as a holistic and humanistic model in education which touches upon the development of what she calls the Four C's in Education—Consciousness, Competencies, Confidence and Conscience. Such balanced approach should enhance a realistic and optimistic outlook just as it should contribute to more effective means of meeting the future. Positive images of the future are powerful and magnetic, driving us on and energizing to give us the necessary courage and will to take important initiatives (Torrance et. al, 1987) and motivating us toward realizing those expectations.

The assumption that the understanding of what may occur, when, and with what force and effects will influence positively the decisions and events of today is a very optimistic one and is probably tenable. There is a paucity of research, however, to support that future studies result in better decision-making and a brighter future. There are hardly studies to substantiate this contention that the investigators are aware of and neither ones to support that as a result of future studies improve in their ability to see the interrelationships of things just as the course in thinking that one group of gifted adolescents was exposed to did not yield significant difference between the two groups of gifted subjects in this study. Needless to say, research is

much needed to demonstrate the effects of the study of the future. It should prove very interesting, furthermore, to determine how other cultures compare with North American findings, and to explore the factors that influence different cultures' images of the future.

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Imagining Tomorrow's Lifetime: Youthful Awareness of Our Expanding Creative Potentials

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Since 1984, Gifted Education Resources of the University of Colorado at Colorado Springs, Colorado (USA), and the Colorado Springs newspaper, the Gazette-Telegraph, have co-sponsored a Scenario Writing Project with the aim of helping build young people's awareness of and confidence in our collective potential to build a better future. Through education and business cooperation, young people are asked to expand their creative potential through imagining, dreaming, and writing about the future. The Scenario Writing Project has several goals:

1) To promote positive images of the future among youth
2) To expand and develop the innate creativity young people possess
3) To improve the writing and thinking skills of youth
4) To provide youth with a significant adult audience with which to share their views of the future

A scenario is a tool utilized by futurists to describe possible futures. Scenarios afford glimpses of possible tomorrows. The initial aim of the Scenario Writing Project was to help young people begin to think about, examine, and express their views of the future. The first theme was "Images of the Pikes Peak Region: 2001." The

theme and contest rules were widely advertised in the newspaper throughout the fall months and by special packets of information sent to schools.

More than 200 young people entered the first Scenario Writing Project in 1984. The four first-place winning scenarios were printed, each in its entirety, on the front page of one of the sections of the newspaper. The essays were generally excellent as measured by such criteria as imagination, creativity, and composition. Students definitely were considering the future. The images projected, however, were overwhelmingly negative. Students described nightmarish images of future landscapes dominated by pollution-choked skies. Totalitarian rulers governed people whose very thoughts were controlled. In some writings, only nuclear wastelands remained of what had once been beautiful terrain. These were certainly not the kinds of images which foster healthy thinking about the expansion of creative potential! Indeed, such thinking may well be creative crippling. People preoccupied with gloom and doom are not in position to first note, and then seize opportunities for creative problem solving and hopeful innovation.

In the second year, the issue of positivism relative to the future needed a special push; thus the theme for the second year of the project became "Welcome To The Future: It Is Going To Be A Great Place To Be." The number of entrants more than doubled in the second year to 500, and a new event was purposefully added. The top 100 entries were identified and all of the 100 young writers were invited to a special Honors Convocation to hear a special message of hope for the future given by NASA Astronaut Lacy Veach. The addition of the Honors Convocation has served at least two functions. First, it provides a vehicle which allows for more students to be truly honored as part of the Scenario Writing Project. Secondly, it brings together bright, talented young people with a significant adult who provides youth with a positive, upbeat, hopeful message about the future. The Honors convocation celebrates the future by accentuating the positive.

The third year's topic attempted to give students a strong sense of ownership in the future by emphasizing their inventive contributions. The theme was "Invention: The Heartbeat of Tomorrow." The number of students entering the project doubled to more than 1,000 entrants, grades K through 12. Sophisticated, creative, and mature thinking was required as students had to first imagine inventions

which would improve the world of the future, and then describe how the world would be impacted positively by their inventions. Students did not limit themselves to technological inventions. Some "invented" new ways to settle international disputes or wrote about new medical procedures and innovations in education. Many included schematics with their essays, and a few even submitted photographs of prototypes of inventions they had built. A display of the drawings and prototypes was included at a special reception following the Honors Convocation. the Honors Convocation speaker was a local scientist-inventor-magician-educator who talked about the magic and wonder in science and invention.

In celebration of the Bicentennial of the Constitution of the United States of America, the theme of the fourth Scenario Writing Project will be "1988-2088: America's Third Century of Dreams, Hopes, and Freedom." It has been useful to change the theme each year. The first theme sufficed to start youth thinking about the future, in general. The second theme accentuated the positive promise the future holds for developing human potential. The third helped young people focus on specific and deliberate uses of their own creativity to expand the goodness and benefits of our collective futures, and the fourth theme asks students to build upon their heritage in creating better tomorrows. Each theme appears to create an interest and excitement in an entirely new segment of the student population than previous themes. New opportunities for locating and expanding student potential occur each year.

Several benefits have accrued in the community as a result of the Scenario Writing Project. The project is an opportunity for education and business to work together in a cooperative venture supporting talented youth. Because the newspaper has a circulation of more than 100,000 and provides front-page coverage of the winning scenarios and the Honors Convocation, the amount of free publicity for gifted and talented education is staggering. Further, the newspaper runs the nearly full-page advertisement announcing the contest on as many as thirty separate days during the fall months leading up to the contest deadline. Education simply cannot buy the kind of public relations benefit the Scenario Writing Project annually creates. Each year citizens not directly connected with education share positive comments relative to their amazement at both the talent and visions of the young people whose scenarios are prominently displayed in the newspaper. Resource teachers for the gifted as well as regular class-

room teachers have begun to make the Scenario Writing Project both an optional long-term assignment and a teaching tool. Science, social studies, and English teachers have joined forces to teach special multi-disciplinary, future-focused units based on Scenario Project themes utilizing both print resources and local experts on a variety of futures-oriented technologies and issues.

The project promotes healthy images of the future among our youth. Witness some of the comments from participants:

> The project helped me think of the problems we have that can be solved.

> I believe the scenario project allows young people to evaluate the future and better plan for their later lives.

> Using a theme concerning the future makes us use our imaginations more.

> I liked the project because it taught me I can do things if I try.

You have a whole city of kids thinking hard about the future rather than watching TV, and that's an accomplishment! Of course, the biggest payoff of the Scenario Writing Project is that young people are using time to constructively find ways to expand their own creative potential in order to build a better world for tomorrow. It has been said that what one person can imagine and envision, another can build. If we help youth first dream about and imagine better tomorrows, we have taken the first huge step toward unleashing the potential which will make such promises become our future realities.

Using Computer Approaches in Searching for Hidden Talent Assets in Brain Damaged Persons

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The use of computers as "informational prosthesis" provides a new approach for the search and education of hidden talents in the case of disabled people. In our Clinical Computing Center of Buenos Aires we have gathered some experience concerning different ways to detect and improve the potential of a damaged brain.

Cerebral palsy is a good example. We introduce the patient and his family to a new culture, the computer culture. This approach can change a whole life, because many important functions that were impossible before, like writing, drawing, communicating, programming, can be available after a training period. We stress the need to start this computer education as early as possible, but even with some cerebral palsy adults we obtained good results.

We don't know what kind of changes might this technique introduce in the neuronal processes of the damaged brain. Perhaps in the near future, some new technology will identify these neuronal changes. But, as a matter of fact, we already detect several significant behavioral changes. To begin with, there is a striking improvement in the motor control of the hand on the keyboard. High motivation and good results are essential to this new kind of "computer rehabilitation." Also the span of attention improves many times, the emo-

tional attitude towards the error changes, there is no fear in the process of program-debugging or in the use of the word processor. Most impressive is the acquisition of new abilities in the domain of the arts, drawing, painting, and music. For the deaf and the voice impaired the use of computer communications via modem opens new possibilities for education and work. One of the cerebral palsy adults has written a book, a novel, with the help of a computer. Another uses a word processor in his new job, a young man is now practicing with his computer at home in order to finish his secondary studies. All of them are discovering hidden, and perhaps unknown, talents that were inhibited by severe motor and language impairments. The computer is the required instrument to bridge the gap.

Improved Artificial Hearts
For People Through Creative Research

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The *I*nstitute for *B*iomedical *E*ngineering (IBE) was under the direction of Dr. Willem J. Kolff from 1967 to early 1986. Dr. Kolff founded and pioneered the first artificial kidney capable of preserving the life of patients without kidneys. He applied the same insights and tenacity towards the development of blood pumps that would be adequate to replace the natural hearts of animals and that would eventually be adaptable to man. The term *transplant*, by convention, implies the replacement of a non-functioning organ by another biologic organ from a donor. *Implantation* implies the surgical placement of a man-made device designed to supplement or replace a malfunctioning organ.

Experimental animals always played a very important role in Dr. Kolff's research. In 1967 and 1968, Dr. Clifford Kwan-Gett attempted to keep sheep alive after their natural hearts were removed and artificial hearts were attached and implanted into their chests. All of these animals died soon after surgery. Dr. Don B. Olsen, a veterinarian, was employed as a consultant to the Artificial Heart Program in an effort to get surviving animals. Indeed, he found that calves were a far superior experimental animal, and soon calves with artificial hearts were living for a significant time after surgery in Dr. Kolff's laboratory.

Dr. Olsen joined Dr. Kolff in 1972, and in 1973, was the first surgeon on the *T*otal *A*rtificial *H*eart (TAH) Implantation Team. These devices were pneumatically powered, requiring air tubes exiting the animal and connected to large external driving consoles. One calf had lived only seven days to this point, and in early 1973, a calf was kept alive 13 days. That same year, the World War II Army barracks buildings, used for research on the University of Utah campus, burned down. The Artificial Heart Research Laboratory was moved to the recently vacated old St. Marks Hospital, located off of the University of Utah campus.

In 1974 a calf was sustained for 94 days, implanted with pneumatically powered artificial heart, a world record that remained until 1976. Surgical techniques were developed and standardized, permitting a large amount of very solid scientific information to be gathered and allowing the device itself, rather than the successes of the surgery, to be critically evaluated.

One innovative surgical technique preserved the natural aortic valve and pulmonary artery valve *in situ*, after excising the natural heart and suturing in and implanting the artificial heart. The first calf in this series lived four months. With the new, improved and standardized operative procedures, experiments could be designed to critically evaluate materials based upon their nonthrombogenic surfaces, as well as design and performance characteristics. This successful standardization introduced the concept of science into what was previously conceived of as a gadgeteering exercise. The vast amount of information obtained from these animal experiments permitted the engineers to gain knowledge of how to fabricate polyurethane materials and design a superior artificial heart.

Healthy calves supported on a TAH were studied after the administration of a wide variety of cardiovascular agents, where this model permitted separation of the cardiac agents from the vascular effects of these drugs. The IBE demonstrated that the administration of digitalis resulted in a 5% to 10% increase in cardiac output, although to that time, many believed that digitalis effected only the myocardium of the natural heart. The IBE also demonstrated that there were improved hemodynamics based upon the action of digitalis on the blood vessels themselves while using a calf implanted with a TAH.

Studies were conducted on the TAH recipient's (calf) response to exercise. The IBE demonstrated that a calf on the pneumatically powered TAH, with a fixed heart rate, would have an increased cardiac output while exercising on the treadmill. The increased output

was achieved by an increased stroke volume, and resulted in as high as a 15% to 25% increase in cardiac output. It was apparent that numerous types of experiments could now be conducted on the very healthy and stable artificial-heart-supported calf.

In 1969 Dr. Denton Cooley put a pneumatically powered artificial heart in a patient (Mr. Karp), who lived 69 hours on the TAH while a suitable natural heart for cardiac transplantation was located. Unfortunately, the patient died of lung infection 9 days post cardiac transplantation.

This pointed to one possible use of an implanted, pneumatically powered artificial heart used as *a temporary bridge*, where large air tubes were required exiting the body and attached to the external heart driver. The patient would be supported by the implanted TAH while a suitable donor heart could be located for the subsequent cardiac transplant surgery. It was believed that the first group of patients to receive the pneumatically powered artificial heart might have the TAH used as a temporary emergency implantation while awaiting heart transplantation.

The IBE did a series of experiments on twin calves at the Artificial Heart Research Laboratory wherein one calf in a pair of twins would receive an artificial heart, later the artificial heart would be removed and the heart from the other twin transplanted into the original calf. One such experiment was conducted using a male calf (Charley) and his dizygote twin female calf (Diane). An artificial heart was placed in Charley while saving the natural outflow valves, and he was maintained for 74 days with the TAH implanted. During this time Charley exercised on the treadmill, and all blood chemistries, hemodynamics, etc. were compared with the normal experimental variations found in similar samplings from his twin sister, Diane.

After 74 days, when Charley weighed 225 pounds, the artificial heart was removed and Diane's heart was transplanted into Charley. Charley grew normally, becoming too large for the facilities of the Artificial Heart Research Laboratory. Being a registered Holstein bull, he was placed in a commercial dairy herd as the herd sire. Three years and three months after transplantation of Diane's heart into Charley's chest, he was butchered for beef. His weight had increased from 225 pounds at transplantation to 1,875 pounds. His transplanted heart, even without nerves, had grown in perfect concert with his body growth. More important, Charley sired 55 calves.

Charley required no anti-rejection therapy, since he was a dizygotic, chimeric twin, whose tissues are a perfect match. This experiment clearly demonstrated that natural hearts could be transplanted into infants. Also, that the transplanted heart would respond to circulating growth hormones from the pituitary gland, to grow in perfect harmony with somatic or body growth. Also demonstrated was that the pneumatic TAH was appropriate when used as a temporary emergency bridge to cardiac transplantation.

Dr. Denton Cooley did his second artificial heart implantation in a patient in Houston Texas in 1981, as we at the University of Utah were gearing up to put the artificial heart in the human. The initial request to the *I*nstitutional *R*eview *B*oard (IRB) was to use the artificial heart as a bridge. However, Dr. DeVries and the University of Utah Artificial Heart Team were denied this possibility by the IRB and the *F*ood and *D*rug *A*dministration (FDA), and were informed that only patients without the possibility of natural heart transplantation could be utilized for a series of seven permanently implanted artificial heart recipients.

With full approval of the IRB and FDA, the artificial heart was permanently implanted in Dr. Barney Clark in December, 1982 at the University of Utah. This landmark surgery was performed by an implantation team with years of training and experience implanting the TAH in calves. The team consisted of Dr. William DeVries, Dr. Lyle Joyce, and Dr. Don B. Olsen. Subsequently, three more patients received the artificial heart on a permanent basis in the Humana Hospital in Louisville, Kentucky, one living 630 days. A fifth patient, a man in Sweden, received a permanent implantation.

The Artificial Heart Research Laboratory of the IBE at the University of Utah then became the center for training clinical teams from throughout the world in the skills needed to implant and monitor the artificial-heart-recipient patients. The first successful bridge to transplantation in humans was done in August 29, 1985 by Dr. Jack Copeland at the University of Arizona at Tucson. Mr. Drummond, the patient, was maintained on a TAH for nine days and is alive and manages a grocery store in Arizona at present.

To date, there have been approximately 165 humans receiving artificial hearts throughout the world. Surgeries were performed in the following countries: United States of America, Canada, England, Sweden, West Germany, France, Spain, Austria, Turkey,

Czechoslovakia, and the Soviet Union. A total of ten different pneumatically powered devices have been used as a TAH. The JAR-VIK heart, developed at the University of Utah and sold by Symbion, Inc., was used in 131 of those patients. This Symbion heart was used in 125 patients bridging to transplantation. Of these, 88 were actually transplanted (37 died while on the device), and 66% lived longer than 30 days and were released from the hospital.

The pneumatically powered artificial heart continues to receive wide acceptance in the treatment of end-stage cardiac disease. At the present time, we researchers are moving into Phase II of the Artificial Heart Development Program, which includes an electrically powered, *T*otally *I*mplanted *A*rtificial *H*eart (TIAH) sufficient to sustain life for up to five years. The TIAH will have an internal battery system and telemetry capabilities to transfer power and information into and out of the body without wires or tubes. This power transmission and diagnostic and control information crosses the intact skin, similar to an automatic garage door control.

There are four funded programs in the United States developing similar devices, including Pennsylvania State University at Hershey, Abiomed Corporation in Boston with the Texas Heart Institute as a subcontractor, the Cleveland Clinic foundation with Nimbus Corporation as the industrial partner, and also the University of Utah. These four contracts cover a 69 month period of time and amount to a little over $22 million. The goal of the program is to have a device for clinical readiness and testing at the end of the contracted period. This TIAH development presents a large challenge to the researchers and the Institute for Biomedical Engineering approaches this challenge with a high level of optimism.

The research animal has in the past, and will in the future, continue to play a paramount role in the development of blood pumps, both for ventricular assist devices and as total implanted artificial hearts. There is no other way to adequately evaluate the ultimate performance of blood pumps except in the real-life situation.

The Cardiology Advisory Council to the National Heart, Blood and Lung Institute has estimated that 35,000 people in the United States who suffer from cardiomyopathy could be saved every year by heart replacement. At maximum, only 5,000 natural-heart donors would be made available for this patient population. Last year (1987), only 1,470 donor hearts were harvested for cardiac transplantation. There is no hope for the remaining number of patients with irreversible cardiomyopathy except the TIAH.

The American Heart Association estimates that 530,000 Americans will have a heart attack this year. Of those patients, 260,000 will die in the hospital. The balance will either recover or die in transit to the hospital. Now, it is not conceivable that all 260,000 Americans in one year are ideal candidates for the TIAH. However, many of these patients are in their young, productive years, only in their fifties or even forties. When these patients have excellent health and normal functioning organ systems without other limiting diseases, it is possible that the availability of a TIAH on shelves in the surgery room of hospitals across the United States alone could be used to save and extend the lives of some of these hundreds of thousands of patients every year. It is conceivable that the recipient of the mechanical TIAH, like many of the recipients of the natural transplanted heart, will return to the work force and their families, extending their productive role in society while contributing to a significant extension of mankind's life span.

The Artificial Heart and Dr. Barney Clark: In Retrospect, Including an Increase-in-Wellness Chart

Larry Hastings
Dartmouth University Medical School

Six years have passed since the first permanent artificial heart replacement surgery in Salt Lake City, Utah in 1982. Though the years have passed, the impact this single procedure has had on medicine and the public's medical awareness is still felt today. There have been over one hundred artificial heart implantations since that date and remarkably, as you read this, you can safely assume that several people are living on the artificial heart and many, many more alive today because of the artificial heart.

The replacement of Dr. Barney Clark's failing natural heart on December 2, 1982 with the Jarvik-7 Total Artificial Heart (TAH) proved to be an historic and scientific event not because it was the first total heart replacement procedure (which it wasn't) but because it gave the public and the scientific community a reason to recognize the plausibility of non-traditional medical interventions. Prior to this, little attention had been given to biomechanical innovations and even less attention had been given to the implications of using an experimental device to treat an appropriately informed and consenting patient. The repercussions and implications of this procedure has led Congressional debates, Food and Drug Administration (FDA) hearings and hours of media coverage. Every person was required to address his or her own feelings about the new age in medicine. It is not

my intention here to delve unnecessarily into the medical ethical controversy of human experimentation except to point out that one of the lasting benefits of this historic procedure was to force the world to identify, address, and provide answers to issues of safe clinical investigations.

The research effort that led to this device being used in the clinical "arena" has spanned over two decades. Drs. Kolff and Akutsu implanted an artificial heart in a dog at the Cleveland Clinic in Cleveland, Ohio in 1957. Subsequently, over $200 million in federal grants have been spent to support research of total heart replacement devices at centers throughout the USA.

Federally funded artificial heart research began at the University of Utah in 1967 when Dr. Kolff moved his research team from the Cleveland Clinic. Later, Robert K. Jarvik in the 1970's designed the Jarvik series of artificial hearts under the direction of Dr. Kolff by incorporating the innovations of his predecessors into his own unique device. In 1978, Jarvik designed the J-7 artificial heart specifically to benefit patients—not for research data gathering purposes and long term animal implantation. Its size and stroke volume (the maximum volume of blood that can be ejected in one heart "beat" — 100 ml in the J-7 compared to 150 ml in the research J-5) were significantly smaller than that of the standard research heart. The blood inflow and outflow ports were designed to fit in the human rather than the calf or sheep.

In spite of these technical advances in Utah, Dr. Denton Cooley of the Texas Heart Institute is given credit for the first and second clinical TAH procedures when he implanted the artificial heart in 1969 and 1981. These artificial hearts were designed by Drs. Liotta and Akutsu respectively. Cooley knew these patients could not survive with their own failing hearts and could not, because of their condition, wait for a suitable transplant donor heart. Unfortunately, even though these patients were kept alive for up to 64 hours on the TAH, each died from complications following the transplantation.

This procedure, in which an artificial heart is used to sustain a patient until a suitable donor heart is available for transplantation, is called a *bridge-to-transplant*. It is a procedure that has been approved for a limited number of hospital institutions today but at the time Dr. Cooley performed his historic operations and at the time of Dr. Barney Clark's implantation it was not an approved therapy and not condoned by the FDA. In light of this, in 1979, Dr. William

DeVries and the investigators at the Departments of Biomedical Engineering and Surgery at the University of Utah made the decision to gain approval from the FDA before using the artificial heart in a patient.

Federal guidelines dictate that a medical device must be approved for an *I*nvestigational *D*evice *E*xemption (IDE) before clinical experimentation can begin. This is a provision that protects the rights of the patient and reduces the possibility of a device that has not been thoroughly tested of being used on humans. The FDA provides that before a medical device will be approved for clinical experimentation it must: 1) be proven safe, effective, and be beneficial to the patient it is meant to treat (through extensive animal and mock circulation stimulation research); 2) it must include an human experimentation protocol that will prove to the FDA that every effort will be made throughout the clinical study to record as much data as possible without reducing the quality of the patient's care; 3) the device and the experimental protocol must be approved for use by the hospital *I*nstitutional *R*eview *B*oard (IRB) where the study will take place; and 4) a consent form must be written that clearly explains to the patient and the patient's family all of the complications that may occur as a result of the procedure.

Preparations to address these concerns for the Jarvik-7 began in 1979 at the University of Utah. The process was very slow because it required reviewing years of animal medical records and included many submissions and revisions of the protocol. FDA approval was not granted until September, 1981—ironically, less than a month after the second Cooley implantation at the Texas Heart Institute.

Due to the inherent high risks of the procedure, the FDA determined the artificial heart to be a last resort in medical treatment and as such could not be used in a patient if any other approved therapy was available. The approved therapies included *transplantation* which meant that the first FDA condoned TAH implantation could *not* be in a patient who was eligible for a heart transplant. The first (and ultimately the second through fourth) TAH patients could not be bridge-to-transplant procedures and therefore these were considered permanent implantations. These limitations made the patient selection process lengthy and difficult. Many patients were evaluated prior to Dr. Barney Clark but none met these strict criteria.

In mid 1981, Barney Clark became interested in the artificial heart because he was suffering from a type of slow congestive heart failure

that was not responding to conventional medical treatment. Knowing that because of his advanced age (60) he was not a transplant candidate, Dr. Clark pursued his interest in the TAH by making arrangements to meet with Dr. DeVries. At the time of his first interview with Dr. DeVries, Dr. Clark was not a candidate for the TAH because his lifestyle was not totally impaired by his failing heart—he was still able to walk around freely even though it was necessary for him to rest frequently.

DeVries satiated Barney's desire to be well informed by showing him the research facility at the old St. Marks Hospital and let him watch part of an implantation surgery in a calf. Most of us at the research facility were fascinated by his interest in the program but did not take him seriously as a candidate simply because he was still able to visit and walk through the facility. He was not sick enough to benefit from a device that would mean being "tethered" to a machine for the rest of his life.

Unfortunately, in the short months that followed, his condition rapidly worsened and as so often happens in congestive heart failure, tasks as simple as sitting up in bed made him short of breath. Dr. Clark's condition deteriorated so rapidly that his doctors were certain that he could not live more than a week. DeVries was contacted and Dr. Clark was flown from his home just outside of Seattle, Washington to Salt Lake City, Utah.

A multitude of tests ranging from psychological to blood to cardiac (heart) function were performed in the days immediately following his arrival to Salt Lake City. The purpose of these tests were multifaceted. As part of the scientific protocol it was necessary to assess his "baseline" condition so that it would be possible later to evaluate the performance of the artificial heart. It was also critical from a medical point of view to determine if Dr. Clark was a compliant patient (willing to participate in the medical treatment that would return him to health) and to determine that his failing heart would indeed not respond to already approved medical therapies.

The consent form (an eight page document) was presented to Dr. Clark and his wife, Una Loy, who together had the immense responsibility of putting into perspective the scientific nature of the impending procedure, the inevitable media coverage, the potential risk of failure, the likelihood of a compromised lifestyle at best, and the undeniable burden of being catapulted into uncharted experimental medicine. As with all patients with serious illnesses who have to

weigh the pros and cons of medical therapy, it must have been extremely difficult to make this decision without feeling driven by the urgency of Barney's condition. Dr. Barney Clark, I believe, was driven by a desire to make one last contribution to his fellow man—he signed the consent form one evening and then again following a day of reflection, which was required by the protocol.

The surgery was scheduled for 7:00 a.m. December 2, 1982. However, during the evening his condition worsened. Emergency surgery was started at 10:30 p.m. December 1st. Dr. Clark's failing heart was removed; the Jarvik-7 was sewn in its place and at approximately 4 a.m. was started. The entire operation took eight and a half hours—over twice as long as a standard research animal surgery.

The post operative course was tortuous and difficult. There were many exhilarating highs and as many plummeting lows. The first recognizable benefit of the artificial heart was the improved blood circulation to Dr. Clark's arms and legs. When the natural heart begins to fail, the body tries to protect the most important organs (brain, liver, kidneys, etc.) by giving these areas more blood and reducing the volume of blood that normally goes to less important body parts. Barney's feet were quite "blue" in appearance as a result of this process. Immediately following the implanting of the J-7, Dr. Clark's feet began to return to a normal pink because the blood was finally being pumped there by the new heart. This was a remarkable phenomenon to see. All other experience in artificial heart implantation was in healthy research animals—the TAH was finally being used for therapeutic purposes! Another triumph occurred when he was able to walk while on the TAH and to do mild exercise.

Dr. Barney Clark lived for 112 days on the artificial heart. Unfortunately, many of the potential risks of the procedure were realized during these days. It was necessary to return to the operating room three times after the initial operation: once to repair a pulmonary "bleb" or hole in the lung that was causing air to leak into the chest (day 3), then again to replace a ventricle in which one of the mechanical heart valves had broken (day 13), and then finally to repair a very persistent nose bleed (day 48). This last surgery would normally not be necessary, but Dr. Clark was being given anticoagulants to prevent the blood from clotting because of the artificial surfaces of the new heart. Other complications were: acute and chronic kidney failure, a generalized seizure of unknown origin, aspiration pneumonia, and other bleeding and clotting irregularities.

Even though each of these complications is in itself life threatening, the most serious was aspiration pneumonia because it started a chain of events that ultimately led to Dr. Clark's death. The aspiration pneumonia arose from a bout with a flu virus, producing vomiting and diarrhea on post-implantation day 91. Treating the pneumonia required, along with other therapy, very powerful antibiotics. A possible complication of this antibiotic therapy is kidney failure and a serious type of intestinal infection called pseudomembranous colitis. Both of these occurred in this situation. Sometimes when the body attempts to fight off a serious infection like this it will dilate all of the blood vessels to allow as much blood as possible to circulate through the infected areas. If the blood vessels are dilated maximally, then the heart has no pressure to pump against and as a result the blood no longer circulates and does not return to the heart. If the vascular tone cannot be reversed through medication then the patient sometimes dies from insufficient cardiac output. This phenomenon is called septic shock and it is the ultimate event that caused Dr. Clark's death. The artificial heart will pump blood if there is blood returning to it. But, just like the natural heart — it cannot pump blood if there is no blood to pump — as in the case of septic shock.

Since this historic one, in Kentucky there have been three permanent artificial heart implantations (William Schroeder, Murray Hayden, and Jack Burcham). Two of them lived far longer than Dr. Clark and all of them, courageous in their own right and in their own way, gained strength and hope from the dedication and courage of Dr. Barney Clark. However, perhaps more importantly is the ground work that was laid by this procedure toward the bridge-to-transplant artificial heart use. Today, only Dr. DeVries is permitted to perform permanent TAH implantations, but nearly twenty surgeons around the world are trained to implant the TAH temporarily while the patient (who would have died otherwise) waits for a donor heart.

Appendix: Two Wellness-Illness Charts and a Gain-in-Wellness Chart on Barney Clark

Calvin W. Taylor and Wm. Lawrence Hastings

Joseph Matarazzo, the main editor of *Behavioral Health: A Handbook of Health Enhancement and Disease Prevention*, invited Taylor to write what proved in the Handbook to be Chapter 8, Pro-

moting Health Strengthening and Wellness Through Environmental Variables. Taylor had the idea and hoped to include a wellness-illness chart in that chapter, but not until the galley-proof stage did he discover a possible source of data to fill in the empty framework for such a chart. He contacted Hastings who had run the technical equipment as soon as the Barney Clark operation was completed and who was very receptive and helpful. Together the two of them set up a draft of three charts on Barney Clark, one for the *first day* when Dr. Clark was so ill that the artificial heart implantation surgery was started several hours before scheduled; a second chart on his *best day* after implantation and a third chart on his *last day*. The chart was to show measures across 13 indicators of degrees of wellness-illness. After they had crudely estimated what the charts would look like, Hastings submitted them to Drs. William C. DeVries and Lyle D. Joyce, the two highly-trained surgeons on the case. These three charts in final form, including titles of the 13 indicators of wellness-illness plus nearly two pages of text, became attached to Taylor's Chapter 8 as the Appendix, titled: "The Artificial Heart Period in Dr. Barney Clark's Life." Dr. DeVries is the first author and the other three are co-authors. This was the only chart on health (wellness) enhancement in the total Behavioral Health Handbook containing over 80 chapters.

On the *final-day* of Barney Clark's extended life the chart showed that the lungs and kidneys, which were both quite ill before he came to Utah for the operation, and the condition of his blood vessels plus the almost complete reduction of cardiac output pulled him downward, off the chart to death. After the death, the artificial heart, which was still functioning well, had to be turned off.

Many months later the idea emerged to plot a chart on the *Increase in Wellness*: upwards from 0; or no change (remaining at 0); or loss in wellness downwards from 0. This wellness chart would be across each of the 13 types of physical and behavioral changes from the first-day chart to the best-day chart. The two charts are shown in Figure 1. Alongside them to the right is the new chart, one of the first of its kind ever showing an increase or loss in wellness across a variety of wellness dimensions. In this case there was only a one step downward for a loss in talking (TAK), only one no change in *O*ther *I*nternal *O*rgans (OIO), and a wellness gain from 1 to 8 points across the other 11 points in the profiled chart.

FIRST DAY   BEST DAY   OVERALL WELLNESS GAIN

OIO = Other Internal Organs	KID = Kidneys	CAO = Cardiac Output	TAK = Talk
LUN = Lungs	COL = Colon	SAW = Sensitivity Awareness	MOB = Mobility
CNS = Central Nervous System	VAS = Vascular	LRE = Listen Respond	EXR = Exercise
	HRT = Heart		
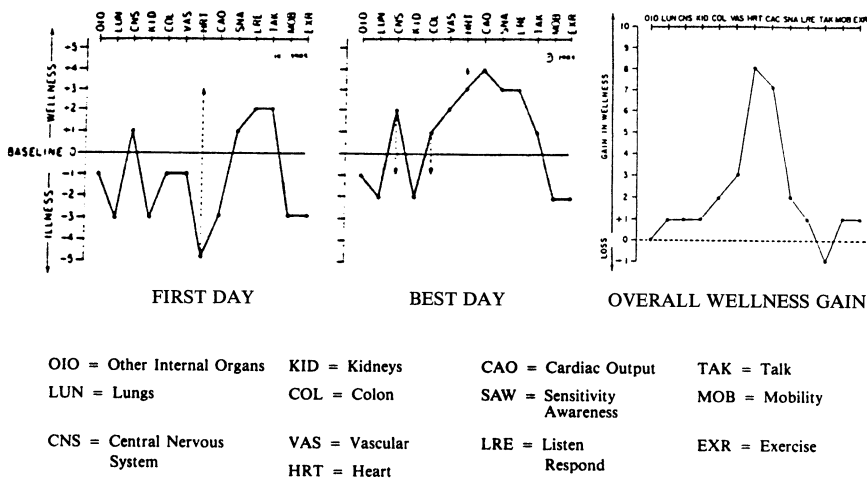
FIGURE 1. THE FIRST AND BEST DAY CHARTS ON BARNEY CLARK WITH AN ARTIFICIAL HEART PLUS A THIRD CHART ON HIS OVERALL WELLNESS GAIN BETWEEN HIS FIRST DAY AND HIS BEST DAY

This is a remarkable total gain, based primarily, of course, from the replacement of his dying natural heart with the implanted artificial heart. The three greatest gains were in the condition and functioning of the vascular system (VAS), the change of hearts (HRT) and the Cardio-Output (CAO), with the other 8 gains being 1 or 2 points upwards from 0 on the wellness chart. This overall gain in the wellness chart *illustrates quite simply and clearly to the general public* the positive short-range effects from the one particular "delivery of health process" on a patient's condition.

Editorial Comments: Dr. Joyce, the second surgeon, moved to Minnesota not too long after Dr. Clark died, to continue his career in surgery. Recently, he was the surgeon who implanted the 100th artificial heart in the world.

No one was more important in the artificial heart program than the world pioneer, Dr. Willem Kolff, the Father of Artificial Organs. The other three most key different contributors to the Barney Clark case were Dr. DeVries, the main surgeon, Dr. Jarvik, the designer/developer of the artificial heart used, and Larry Hastings,

responsible for the successful functioning of the outside equipment keeping the inner artificial heart operating appropriately and optimally. Of these three, only Dr. DeVries was successful in being accepted into a medical school in the USA. Together, the other two were rejected at least 5 times in trying to get into a USA medical school, with Dr. Jarvik finally being accepted into a medical school in Italy—but eventually completing his medical training in the USA. This was obviously of great interest to the Utah research team which studied physicians-in-practice, led by the Dean of Medicine, Philip B. Price and Calvin W. Taylor (1971).

Immediately after Barney Clark was functioning on his artificial heart, Larry Hastings, having no real precedent to follow, stayed awake for three full days-and-nights. He thereby made sure that enough blood was being pumped to keep Barney Clark alive and not too much blood and pressure was occurring to burst the patient's blood vessels which, previous to the first day operation, had been rapidly degenerating.

Larry Hastings continued working in this medical center area with Dr. Kolff, with Dr. Jarvik and with Dr. Olson at his animal heart-implantation laboratory before the Barney Clark case. He then accompanied Dr. DeVries to Kentucky to assist on other three artificial heart patients there and also traveled widely in many countries to train and help persons in his high tech part of operating the outside equipment in the artificial heart system. He then returned to continue to work in medical research projects around our university including at the adjacent University Research Park. He has been accepted to the Medical School at Dartmouth, starting this 1988 Autumn. He deserves three big cheers for his excellent past accomplishments and toward his future in medical school and as a physician.

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Motivating One's Self To Be Active: To Participate Is To Live— Passive Spectators Only Exist

Dick Bass
Founder of Snowbird, Utah

My first subtopic will be three fundamental beliefs that have shaped my attitude toward life. Then I will explain why and how I started high altitude climbing in my fifties, with some description of my summit day on Everest, a little over two years ago on April 30, 1985. I'll finish with a number of perspectives which my four-year mountaineering career reinforced as well as taught me, and which have helped me down here at lower altitudes not only to survive, but to thrive as well—at least psychically and physically.

First, and most important, we need to develop a spiritual faith at the innermost point of reference in our being. If I only have my limited physical strength and mental ability to rely on, I will often "run out of gas and come to the end of my rope," but if I have a bottomless reservoir of spiritual faith, I have come to find that no load is too heavy or trial too great for me to hang in there. Believe me, no matter what degree or number of disappointments, hard knocks, even tragedies, you have had to endure to date, more and greater ones lie ahead, without any remaining strength from yourself or friends. That's when you will realize and admit there is an infinite spiritual awareness you have to believe in and draw on. Unfortu-

nately, it often takes a dire circumstance for many of us to start believing.

So, how have I developed my spiritual faith? Basically, by believing that I am a child of God's creation, that I'm here to show my love and appreciation to Him for the blessing of life by striving to understand and fill as best I can the niche for which He made me.

Second, we need to win and maintain our self-respect by using the strength of our spiritual faith to always keep working at such attributes as integrity and decency, initiative and will-power, courage and humility. And we can't practice these qualities while sitting with our arms folded, waiting for the world to come to us and lamenting our state in life. It takes curiosity and enthusiasm, optimism and certainly a sense of humor to stay energized, to keep trying, to continue growing—in short, to live.

Third, no matter how much spiritual faith and self-respect we attain for ourselves, it really doesn't fulfill us unless we share with our fellow man—and by that I mean share not only our material possessions, but even more important, our strengths, our talents, our love—in short, our whole being. "What we give, we have; what we keep, we lose." Think about it—if we feel we have to keep our "things" and talents just for ourselves, we become possessed by them, even enslaved. But when we give them, we have had the knowledge and appreciation of them, enjoyed their true essence without losing our spiritual freedom or values.

It only takes a casual perusal of our daily papers to see one illustration after another of how people have sold their self-respect, their freedom, their souls because of obsession with material gain and accumulation—and the tragedy that has resulted.

Let me now give you a highlighted background of why and how a low-lander from Texas started being a high altitude expedition climber in his 51st year, which was only five years ago.

I was born in Tulsa, Oklahoma, raised in Dallas, Texas. I had an English teacher in grade school named Mary Coleman, a female "Mr. Chips" if you will, who had the marvelous ability to make literature and poetry come alive and captivate the interest of not only the girls in her classes, but the rough-and-tumble boys as well. At the time, I thought I would grow up to be a high school English teacher, a Chips reincarnate, and "have thousands of children" whom I would imbue with the wonder and beauty and love of life which she imparted.

On departing for college in September, 1964, I was still full of this youthful idealism. Pragmatism and materialism intervened, however, and in my second year at Yale I gave up my English major for one in Geology. (I had been very careful in choosing my father, who was an independent oil man, so I turned away from the cloistered halls of academe to the asphalt jungle of the market place.)

Backtracking for a moment, when I was 9 and 10 years old I read several books written in the 1920's and 30's by a romantic explorer, Richard Halliburton. They were full of adventurous travel and escapades in all corners of the world. In the summer of 1949, between my junior and senior college years, I climbed my first mountain, the Matterhorn, with a guide but without any prior experience. Halliburton had done it in 1921, and I figured if a Princeton graduate from Memphis, Tennessee without any prior experience could, then a Yale from Dallas, Texas could also. In 1951, while a naval officer on the U.S.S. *Essex* in task force 77 during the Korean war, I again followed Halliburton by climbing Fujiyama in the late fall. Just a very long hike in the summer, but like Halliburton, I did it when it was covered with snow and ice — and that made a tremendous difference.

After naval service and having been exposed to snow skiing in New England during college, I started going to Aspen, Colorado, for my vacations in the winters of the remaining 1950's. That led to my being at Vail in 1962, and then to my becoming the developer of Snowbird in 1969.

Snowbird immediately required all my time, energy, money, and nervous system, so my main recreational avocation became my main business vocation. Although I was definitely an accomplished skier, I had not done any more climbing since Fijiyama until 1979, when I took my four grown children (two sons and twin daughters) on a five-month adventure odyssey around the world. Three of them had just finished college. Since I had been divorced five years earlier and the girls had gone with their mother and the boys had stayed with me, I wanted to have a big togetherness for all of us before they went their separate ways. With packs on our backs, I wanted us to test our daring and stamina and to learn more fully that we are a human family on spaceship earth — that although we have different languages, religions, and customs, we all have the same basic natures with hopes and fears, joys and sorrows, and that people have a high degree of human warmth and decency.

The trip exceeded my fondest dreams as we climbed mountains

like the Matterhorn, Olympus, Fujiyama, swam 2½ miles across the hellespont (or dardenelles), jogged and scrambled for 31 miles over the original mountainous route of Phidippides from Marathon to Athens when he brought the message of victory over the Persians in 490 B.C., scuba-dived as deep as 240 feet off Sharm el Sheik at the south end of the Sinai Peninsula, hiked the rain forest of the Milford Track in New Zealand and many other adventures as we also toured and became much better acquainted with the history, culture and religions of southern Europe, the Balkans, Turkey, Greece, Egypt, Palestine, India, China, Japan, New Zealand, Polynesia, and Hawaii.

I discovered these physical, adventurous giant leaps into the unknown gave me the opportunity to go for something, stretch myself and build my self-respect and self-confidence in a short time frame. My psychic wounds and diminished sense of self-worth, stemming from my divorce and extreme financial pressures of the 1970's because of Snowbird, were healed. As always, the "teacher" learned even more than the "students," and I came home two days before my 50th birthday with a renewed sense of self-respect and self-confidence, and the determination to continue such character building and enlightening experiences.

I told my children I had spent the first half of my life concentrating on the "have-to's" and the "shoulds," but for the second half I was going to emphasize more the "want-to's." I would be responsible, of course, but I wasn't going to be shackled by my former tendencies and yardsticks. I was going to get off "Mammon's treadmill" at least once a year, no matter how cluttered my desk and full my schedule, or how many important deals I had brewing—or even how much money I owed —and take on some adventurous physical challenges and/or some educational, entertaining tour. As an ancient once said, "He who does not know the world, does not know his place in it."

In July, 1980, I married a lively lady named Marian Martin who is with me today. In addition, in November, 1980, at the first Snowbird 10-year employee award dinner, I had an experience that not only stimulated my second-half-of-life attitude, but resulted in testing me to a degree I had never experienced or thought possible.

A 29-year-old girl named Marty Hoey, whom I did not know other than by name and position (she was head of the Snowbird safety patrol), was frowning at me as I recounted my 1979 family ad-

venture odyssey to a group of Snowbird employees. I was about 20 minutes into my dramatic monologue when one employee asked if I knew that Marty was the only female guide on Rainier and McKinley. Welcoming the opportunity to try and overcome her obvious pique towards me, I said as friendly as I could that I would like to climb McKinley and would she be my guide. Without breaking her scowl, she icily replied, "Bass, your hot air won't get you up that mountain." In the true sense of the phrase, she had thrown down the gauntlet. I felt I could do anything she could do; I just didn't realize at the time that I would be taking on Superwoman. And that's what started my high-altitude expedition climbing career.

There is not enough time to relate in detail what followed, but suffice it to say that 6 months later in May, 1981, Marty, my four children, four other Snowbird employees and myself were off to climb McKinley. Marty had needled me unmercifully about my lack of conditioning during this period, and I kept trying to explain to her that Snowbird financial pressures kept me so much on the go and tired-out that I simply could not do the training she demanded. She told me as we left, "Bass, there is no way you're going to climb McKinley with your lack of preparation. I'll take you with us, but you are not going to jeopardize the others' chances. When I decide you've gone as far as you should, you will have to 'camp' by yourself and wait for us to return. and there will be no appeal."

I remember feeling scared and inadequate as I started up the Kahiltna Glacier on skis, bent over with 70 pounds on my back and pulling a 35-pound sled. It now fully impacted me that this was a major climb, a giant leap into the unknown that made the 1979 odyssey pale by comparison, but I had such a "mad on" of determination not to let Marty have any excuse to "camp" me on the sidelines that she could have literally stuck a knife into me and I wouldn't have winced or cried aloud. Twelve days later, after more discomfort and agony than I can express, I stood on the summit of McKinley at 20.320 feet in -37 degree temperature. The sense of accomplishment made me feel fantastic.

I arrived back at our high camp at 17,200 feet on the first rope team around 10:00 p.m. The others with me immediately dove for their sleeping bags, but I stayed up melting snow into hot water for soup and drinks—and waiting for Marty to arrive with the slowest group which she was shepherding down. Hoey waddled over to me in her bulky down clothing (it was now -45 degrees) pecked me on the

cheek and said, "Bass, I don't believe you, you're an animal" — her mountaineering jargon for the supreme pat on the back.

Then I said, "and one more thing which you'll probably scoff at just as you have my McKinley goal for the past 6 months: I had a great idea coming down from the summit." "What's that?" "Since I have now climbed McKinley, I'd like to climb the highest mountain on each of the other six continents." Marty paused, then said as forcefully as she could muster strength for, "Gosh, that's a fantastic idea. I'm not going to scoff at you; in fact, I'd like to go too."

McKinley not only taught me basic mountaineering skills such as how to use my ice axe, crampons, jumars, karabiners and ropes, along with setting up camps cooking, what to eat and drink and when to wear different types of clothing, but also I found I was particularly well-suited for high altitude. Without any jogging, swimming laps, or pumping iron, I had a resting pulse of 41, blood pressure of 102 over 63, 25% larger lung capacity than normal (typical of a large mouth), and evidently made red blood cells (hemoglobin) very readily.

The main thing I learned, though, is that the mental attitude is just as important as all the preceding put together. And here *I discovered I had a secret weapon — my poetry*. Because of Miss Coleman's influence in my childhood, I knew a lot of poems by heart. I found that by reciting them to myself as I trudged along, I could get my mind off the physical discomfort of screaming lungs and burning thighs, the mental frustration and doubts, even fears. I soon learned to *fit a poem to the occasion* — extended, entertaining, *narrative ones for long pulls on gentle slopes*, shorter *more inspiring ones for the steep grades* where I had to put my whole being into "grandma," the lowest gear I had. In a sense, *I hypnotized myself with these poems* and after periods of time I would "come to," having covered long distances without realizing it and without having to contend with any negative thoughts — the most draining, debilitating influence we can succumb to — whether on a mountain, in the valley, or on the plains.

Right now, five years later, I would probably be still only talking about climbing the other continental highs except for the unbelievable coincidence of meeting Frank Wells that August of 1981. He was the president of Warner Brothers, but had dreamed since climbing Kilimanjaro in 1955 of being the first to make the highest mountain on each continent. With my having independently come up with the same ambition 26 years later, we shook hands and agreed that we would try to climb the seven summits in 1983. He would quit his job and I would play hooky.

Again, I must jump over many amazing and amusing incidents, but let me say that Frank's career (from summa cum laude and Phi Beta Kappa in college, Review Editor and Order of the Coif, through an outstanding legal career to the presidency first of Warner Bros., and now Disney) were also instrumental in his handling most of the planning for our four "practice" climbs in the remainder of 1981 and 1982, and then the big campaign for 1983. Frank did not succeed on any of the practice climbs because he is physically very unsuited, but he demonstrated in 1983 the greatest example imaginable of how sheer desire can overcome all odds as he finally succeeded in climbing six of the seven, failing like myself only on Everest due mainly to high winds.

Marty Hoey was killed on our 1982 "practice" climb in Tibet, and although she was not with us in '83 in real life, it was certainly her spirit that was always out in front leading me on, looking over her shoulder with a big smile, calling me an "animal" and giving me a "thumbs up" whenever I was really "at the end of my rope."

I went back to Everest without Frank in the 1984 post-monsoon period from mid-August to early November. My two American companions, David Breashers and Gary Neptune, and I were helping the Nepal police with a very much needed, and historically first, cleaning expedition. However, for over two months we were never permitted to climb higher than Camp 2 at 21,600 feet due to political restraints by some officials at Katmandu. Suffice it to say, we were pawns in an Asian political chess game. Upon returning to the United States, David Breashers, knowing some of the Norwegians who had the permit for the same Nepalese South col route the next spring of 1985, contacted them and negotiated a contract by which the two of us could join their team and use their route after they had completed their summit attempts.

The Norwegian team arrived in Nepal in late February. David Breashers left the U.S. on March 13 and I went over on March 25. The Norweginas had the strongest Sherpa team ever assembled and they succeeded in placing seven team members and seven Sherpas on top in record time, the last group making it on April 29. David and I and our Sherpa, Ang Phurba, made it the next day on April 30.

Before leaving Everest, I want to briefly describe a little bit of my summit day. We left our high camp at 26,200 feet at 2 a.m. It was pitch black, with just enough haze to hide the stars, and luckily with no wind. David Breashers told me we wouldn't rope-up because he didn't think we could arrest one another if either started slipping off

the steep side-slopes or knife-like ridges. It was very icy and rocky, and frankly I didn't have any confidence in my proficiency, but I had come too far to even consider quitting.

Seven hours later, I was just below the 28,750-foot south summit, which is a little over a half mile before the ultimate summit at 29,028 feet, on a narrow ridge as hard as a billiard ball; my crampons and ice axe wouldn't bite into the surface and I knew if I started sliding the least bit it was 7,000 feet of vertical down the Nepalese side to my left and over 8,000 feet on the Tibetan side to my right before I would come to a stop.

I was seized with *the biggest negative thought of all—the immediate fear for my life*—and I was mentally paralyzed to a point beyond relief from any poems, aphorisms or inspiring thoughts—even the often-used words of my wife which she had told me just before my first Everest trip of 1982—"Never let your guard down; remember how much you have to come home to; and I love you."

And you know what flashed through my mind? "Bass, you stupid jerk, this is the most ridiculous thing you've ever done. You've made a lot of giant leaps into the unknown before, but this one takes the cake."

I started laughing at the incongruity of it all—here I am going for the highest point on the earth, at 55, without proper conditioning or acclimatization, to say nothing of my inadequate mountaineering experience, since this was my first time to be unroped in such a precarious place in my four-year climbing career. But *the absurdity, the humor of it all kept me going as my laughter broke the fear chain.*

Reflect on it. How could I laugh? Because it was ridiculous and because I had transcended any concerns about lenders, regulators, divorce, disappointments, physical discomfort or the myriad other things we spend so much of our time fretting and being anxious about. In a sense *I felt freed from all that human bondage and baggage.*

Naturally, I couldn't be very analytical or philosophical at the moment because my survival instinct demanded I concentrated everything I had on each step and movement that followed. But in looking back, I truly believe that all of the similar type things that happened to me that day and which are covered in a recently published book called *Seven Summits* were God's way of reaching me, preparing me

for what lies ahead in my life's work—which is to complete at Snowbird over the next 15 to 20 years a center for human understanding, dedicated to the development of a body, mind, and spirit—a renaissance center if you will.

In the past, I've fretted and fumed as much as anyone here; and that's what caused anxiety, which by definition is unresolved stress, the biggest contributor to heart attacks, ulcers and nervous breakdowns. I have more stress now than every before in my life, but I can control it from turning into anxiety even when I go to bed by reminding myself of Everest and saying, "Bass, you're alive! And where there's life, there's hope. Get your rest, you can continue tomorrow. But no more of that gut-grinding, rolling and tossing anymore."

So, what has all this meant to me? Primarily I definitely have a greater appreciation for the blessing of life and greater spiritual and philosophical strength to take the pressures and hardships in stride. I truly feel the "second fifty" can and should be the best half of life. Some of the perspectives which I'm sure will help make it that way are:

1. "We can achieve whatever we can conceive." In other words, we can do anything, if we have the faith and want to and/or have to strongly enough.

2. What the mind wills, the body follows. We don't just have a "second wind" or "third wind," we have almost unlimited winds. Even when things get so bad physically and/or mentally that I don't have the ability to "reason" myself into a good attitude, I use uplifting, inspiring, humorous poems and aphorisms as a reflexive, positive "quickfix."

3. It's not so important what happens to us as much as our attitude about what happens. I call it "mental" jujitsu, by which I mean we can convert adversity into a blessing if we accept the fact that we are not supposed to enjoy the "unpleasant, difficult" things; we learn from them, and that's how we develop our spiritual faith, self-respect and self-confidence, which gives us our true, lasting joy.

4. It is actually good to have a lot of problems, because that way nothing gets blown out of proportion.

5. "If we never stop, we can't get stuck." Mountain climbing is basically putting one foot in front of the other until you get there. In the final analysis, that's what life is all about.

6. "What we gain too easily, we esteem too lightly."

7. "You're not a champion 'till you come up off the mat."

8. To participate is to live; spectators only exist.[1]

9. Never worry about being embarrassed, but guard constantly against doing things that make you ashamed. Too many people are afraid to try new things because they feel they will not do well, but we can't learn the nature without taking on new exposures. Even if we don't succeed to the degree or the schedule we desire, each new attempt positions us further along the learning curve of life. On the other hand, if we do things that cause us to be ashamed, we are diminishing our self-respect and as I said before, next to our spiritual faith, that is our most vital valuable possession.

Another way to put it is—The only real "failure" is omission; both the omission of my trying at all and, even much worse, the omission of integrity and decency in the things we do try because then we become an active force of ill. I "failed" (as people usually use the word) three times on Everest, but I didn't stop trying, and those failures gave me the necessary mental strength and experience to finally make it on the fourth try, with less than half the acclimatization time that anyone else has had before, to say nothing of my lack of conditioning or climbing proficiency.

10. And lastly, probably my favorite and most meaningful quote which I feel best sums up everything I've wanted to convey: "the great use of a life is to spend it for something which outlasts it."

So, let's assume we go for it, we hang in there and we finally succeed. The way I look at it, we shouldn't get puffed up about ourselves, we're only a medium through which God's will is being manifested.

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1. Lengthy lectures, TV programs, and TV ads can and do produce in audiences some part-time passive spectators and listeners. However, classes and other programs can be redesigned to turn many in an audience into active, lively participants most of the time. People on their own can even break out of "traditional passive spectating ruts" and *motivate themselves to become very active participating-spectators, even super-spectators* who are very much alive. (See reprints of "Golf—The Super Spectating Sport" by Calvin W. Taylor, Keith P. Henschen, James R. Ewers, Clark Swisher, and Dan Sachau. Available in Taylor's office in Bldg. #505, University of Utah, Salt Lake City, Utah 84112.)

Creative Powers In Adulthood: Their Discovery And Recovery

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Introduction

In 1899, the Norwegian dramatist Henrick Ibsen, then 71 years old, wrote and published the last of his plays, *When the Dead Awaken*. The play is centered around the wealthy and famous sculptor, Professor Arnold Rubek, who is described as having done nothing but routine busts of affluent people since completing his acknowledged masterpiece 20 years previously. The title of the play is metaphorical not only of Ibsen's theme, whether life itself is recoverable in the later years, but also of a rather poignant situation in the author's own life. Ibsen had tried to resume composing lyric poetry in his later years, but found these special powers exhausted. He also meant to write additional plays, but a stroke immobilized him. Peter Watts, a discerning commentator on Ibsen, remarked on the strange prophecy in *Peer Gynt*, written in Ibsen's youth, of a reproach to Peer:

> We are songs,
> you should have sung us.
> A thousand times
> you curbed and suppressed us.

> In the depths of your heart
> we have lain and waited . . .
> We were never called forth—
> now we poison your voice.

The curious myth that lyric poetry can be written only by the young is countered by many older poets, the most notable example being Thomas Hardy who triumphantly turned solely to poetry from his late 50s until his death at 87. In other arts, similar paradoxes exist: for example, Rossini's failure to produce other than a *Stabat Mater* for nearly 40 years after *William Tell* is usually cited as an example of the exhaustion of creative powers, whereas Franz Liszt continued to break new ground as a harmonic innovator in his early 70s.

These creators were people of genius and are cited because the famous illustrate some of the central concerns and puzzles of creativity in adulthood. Do creative powers seem to wither and die during the life journey? If creative powers are "lost," can they be regained? Why do some creative people have the virtuosity to enter new fields or companion fields? More important than these questions, how do we recognize creative powers in adulthood, and how is it possible that many years may pass before these are actualized? Is it possible that one may actualize lesser powers and neglect richer talents? These questions prompt us to look at the meaning of creativity.

A Definition of Creativity

It is useful to come to grips with a working definition of what is meant by creativity. I have used the following definition in the past:

> Creativity is the process by which a man or woman employs both the conscious and the unconscious domains of the mind and self to combine already existing materials . . . of many kinds into fresh combinations which in some degree, small or great, cause significant changes in the self system of the person concerned, or which significantly alter the environment surrounding the person, whether the environmental change is minuscule or enormous.

One useful addition to this definition is the concept suggested by Seidel (1966) in *The Crisis of Creativity*. Seidel is at pains to distinguish between creation and simply recreation, and between creative activities and hobbies. Repeatedly, he uses the phrase, "the passion-

ate interest of dedication,'' something to differentiate between a child's delightful but nonetheless *pseudo*creativity and an adult's creativity (pp. 134-140). Without something like Seidel's reasoning, the significance of creative acts and processes can be lost in a sea of activities, trivialities, and banalities.

When one shifts the focus away from the creative act of process to what might be called ''creative personhood,'' new perspectives can be gained. Formed in working with what I call ''Ulyssean Adults,'' my approach is to creativity as a widely-ranging human phenomenon and not simply among famous creative people.

Qualities of Creative Personhood

Despite my wide-range view, it is from the famous, or at least from among the clearly identifiable creative adults in our society that we gain what we can of the concepts of the creative personality. Certain characteristics of creative personhood have appeared so persistently in research studies (Taylor and Holland, 1964) that we can describe some undisputed qualities: typically good, but not necessarily high, intelligence; openness to experience; tolerance of ambiguity and uncertainty; imaginative use of disorder; the wise discipline of order; self-sufficiency; the capacity for ''the intuitive mode'' (Ornstein, 1974); the (w)holistic capacity for ''peak experiences'' (Maslow, 1964); traits of divergency (Torrance, 1962) and also unconventiality; sensitivity to problems; fluency in thinking, i.e., fertility (Guilford, 1964, 1977); powerful motivation, drive and industry (Taylor, 1972); ability to see the not seen, to synthesize more and richer ideas, to fantasize more richly; possibly to be psychodynamically more complex (Barron, 1963); and to have a heightened sense of awareness and of wonder (Fromm, 1970).

I would add to this list the power of the will and the capacity to exploit imaginatively the elements in the environment that both promote and inhibit the creative life. The discussion of these qualities of the ''famous'' creative personality, taken in the abstract, fosters the problem that the famous may seem removed from the world of ''ordinary people,'' those adults who I prefer to describe as ''private adults'' insofar as the world is concerned. The characteristics of creative personhood operate as if on a rheostat, burning from bright to dim among individuals, and even more importantly, burning with various radiances *within* many adults as individuals. Accepting this concept, we may then consider with more confidence and more

universality the discovery and recovery of creative powers of adults during their life journey.

The Failure to Discover and Recover

Actually, the discovery, assessment, and actualization of talent remains one of the great fields of failure in the human scene. Wherever else among the adult population we may look for unactualized talents, we can at least logically expect to find the human tragedy of lost or undiscovered creativity more prevalent among older people whose formative years were passed among narrow or aborted schooling, confined social scenes, and stunting and constricting occupations. We seem to be on firm ground, furthermore, when we extend this hypothesis about age to the realm of social class; there is rich evidence in the life passage studies of scholars (Williams & Wirths, 1965; Reichard, Livson & Petersen, 1962) that ego-coping powers and the power to extend the repertoire of interest and explorations in the life journey of the self are often weakened by the constricted environments of unromantic poverty and impoverished education. However, we have barely set out the guidelines when images also arise of the destructive effects of suffocating upper class mores or the rigid life patterns of those adults whom J.E. Marcia (1966) has aptly termed "Foreclosed Adults."

Foreclosed Adults: Mourners and Seekers

Here we consider those adults who in middle and later years mourn the apparent paralysis or demise of their creative powers or continue to seek their own creative self-actualization. The mourners and the seekers are the people for whom this discussion has special relevance and resonance.

The Mourners

The mourning process has at least three forms: mourning for powers never identified; mourning for powers never actualized; mourning for powers actualized but blocked or in progressive decline. All of these states of loss clearly involve much wider processes of self-development and self-actualization. A phrase used to describe the work of a notable creative person who in later years produced an inferior work is, "This showed a falling-off of powers." Many

assume that the phrase means a decline of intrinsic creative powers. On reflection, this seems to be a very inadequate, even naive, view of the situation.

Before one can accept this view, three substantial questions must be investigated.

1. How do creative powers cross with human interests and satisfactions? Cases abound where creative talent existed for a certain activity, but the interest of the potential creator did not: witness the physician turned novelist, or the German scholar turned painter. Often the talent or gift harnesses and drives creative power; often some life intersection rouses interest, which then awakens sleeping creative potential. The reverse process acts to immobilize or silence talent. One formidable theory why the highly creative cease to create in their middle or later years is that many become captives of high corporate, academic, or foundation posts. In the arts, interests also may change or die out. In the cases of Handel and Walter Scott, it was not their creative powers in their fields that died, but their markets; with new fields, new audiences, and resumption of powerful interests, their creative energies were renewed.

2. How does the actualization of creative powers intersect and interact with what adult life and learning theory sociologists term "environmental press," and what Robert Butler (1967) called the multiplex theory? Butler referred to "influences other than chronological aging *per se* which facilitate or inhibit creativity," for example, physical disease, personal loss, sociocultural conditions, personality structure, and position on the chronology of life stages. When I asked 30 adults aged 60 to 80 who had begun adventures in the arts late in life why they had delayed so long, the first reason was being occupied with other life duties.

3. How are creative powers affected by the counterforce or the facilitation of the ego and the mysterious hidden forces of the personal self? There are examples of the potentially gifted actor who never opens his career because of disabling shyness; the creative inventor who abandons his work because of poverty. How far was the failure to actualize their powers the failure of the ego to cope with certain inherent weaknesses in the self-system?

The answers to these questions are difficult, but the questions need to be kept in mind so that observers of the creative process will not place an undue load on the rise, fall, birth, and seeming extinction of the creative powers themselves.

The Seekers

For many adults, notably those I call "seekers" or specially-concerned adults, it is a matter of vital importance that their creativity should be recognized and actualized. For them, the semantics of certain aspects of the creative process are critical. That is, when some talk about "peaks" of creativity, about being at "the height of his or her powers," and about the "falling-off" of powers, it is important to know whether one is talking about intrinsic creativity, the influences of environmental press, or dynamic growth as against the defenses and defeats of the ego as pilot and manager. In other words, what roles do habit, interest, confidence, and anxiety play in the discovery, maintenance, seeming loss, and recovery of the adult's creative powers across the life journey?

The Five Myths of Aging

The issues raised by these questions are very complex. The one of greatest concern to the seekers and mourners is, do the creative powers of individuals decline across the years? Examined in depth, this issue brings in other essential arenas of creative life. It also serves as a reminder of the widely extended mythology of aging: 1) the myth of inevitable senility, 2) the myth of inevitable sexual impotence, 3) the myth of inevitable rigidifying of the complex of attitudes, 4) the myth of inevitable decline in learning power, and 5) the myth of inevitable decline of the creative powers. The danger of the myths, all of which contain elements of truth, is that they may become self-fulfilling prophecies for great numbers of people who foreclose their life systems to the radiance of living and loving, to the adventures of learning, and to the self-renewing exploits of the creative life.

Components of the Creative Process

The investigation of creativity and of the creative processes is a noble subject, and it is formidable in its complexity and variety. However, in the maze of interpretations and speculations about the creative process in the past 50 years, there are two major components. One is the function of the conscious mind, treated wholistically by Ornstein (1972) in *The Psychology of Consciousness*. The other is the function of the unconscious mind, upon which Arthur Koestler (1964) has lavished so much attention.

The role of the conscious mind in the creative process, which is

seen conspicuously in certain exercises in what Alex Osborn usefully called "applied imagination," and in the problem-solving preoccupations of Edward de Bono and Moishe Rubinstein, raises inevitably the role of intelligence and creativity. The continued ability to learn well, that is, not only in the sense of being open to experience, but to learn, to grow, and to learn again from these experiences, suggest that the sustained powers of the human mind is an important contributor to sustained creative potentiality. If this is so, it is imperative to know whether, as a rule, there is a falling-off of cognitive and intellectual capability as adults progress through the life journey.

The Power of the Conscious Mind

We have strong evidence, notably from carefully conducted longitudinal studies of aging adults, that for great numbers of men and women, a decline in learning power does not occur. Theorists and scholars in learning theory no longer consider David Wechsler's fine but limited studies (1981) of the functioning of intelligence in adulthood as other than important reporting of certain aspects of the field. An abundance of evidence is available (McLeish, 1976) of sustained powers of the conscious mind among those adults who choose to keep their minds active and seeking.

The Power of the Unconscious Mind

As for the unconscious mind, that reservoir of fantasy and of the germination and fusion of imaginative ideas, it is unlikely to suppose that whatever the resources of the unconscious mind in an individual, it somehow loses potency as the years progress — unless, as with the conscious intelligence, nonuse in creative play and work, a settled torpor, boredom, dullness, or a wholly immobilizing neurosis or psychosis could diminish or shrink the capacity *to use* the imaginative powers. If sensory experiences and innumerable life encounters and communications are constantly enriching the reservoir of memories, concepts, emotions, and ideas of the unconscious, the passage of time should *increase* this immense integrator and generator of the applied imagination.

Records of the Creative Process

A valuable longitudinal technique for reporting the rise, fall, or steady state of special-field creative talent already exists in the inten-

sive study of the whole life of the creative adult. With the exception of the creative person himself or herself, no truer, more comprehensive panorama of the whole course of an individual's creative powers can be found than from the objective and dedicated personal biographer.

It is a pity that in place of such deep and comprehensive studies of creativity in action that we continue to be presented with unexamined replays of Lehman's *Age and Achievement* (1953), in which massive statistical runs derived from publication or issuance dates of supposed paramount masterpieces were used to arrive at the conclusion that creativity peaked in the early 30s, closely followed by a second peak in the later 30s, and declined across the later years. In my book, *The Ulyssean Adult* (1976), I have dealt at some length with Lehman and associates and what I consider their well-intentioned and arduous, but superficial and culturally jejune study. Not the least of their problems was attempting to equate the creative summit of an individual with a single highest peak performance. A small but revealing study of my own showed the extraordinary creative power far in the late years of 125 noted scientists.

No one denies that creative powers, or at least production powers, of many people decline across the life journey, but it is a giant leap to contend that all creativity declines with age. In 1956 Lehman modified his views, as a result of criticism (see Wayne Dennis, 1972), to "it is not age but the factors that accompany age"—which simply returns us to the five myths about aging referred to earlier. The fact is that the key to grasping the relationship between aging and creative powers lies not with the mechanical exercises of Lehman et al., but with an agglomeration of humanistic studies of creativity at work in the whole life progress of talented and productive people—studies that include the invaluable insights of the creators themselves.

Recovering/Revitalizing Creativity

The ultimate question is not whether creative powers steadily diminish and die from the end of the third decade on, but rather how men and women can maintain and maximize and, in cases where creative powers have largely fallen into disuse, recover them and through them revitalize their lives.

The complexity of the subject is awesome, yet it seems possible to cite a series of personal or environmental conditions that may nurture and sustain creative powers and production:

1. Give oneself permission. Many times messengers from the domains of new ideas and fresh experiences may knock on the doors of our consciousness. If the doors are kept firmly closed through fear, prejudice, or other routines and habits of foreclosed adults mandated from the past, then new creative works, inventions, strategies, or interpersonal transformations may never be brought into existence.

2. Allow oneself the time. Time may affect for good or ill the release of, first, the general creativity of a specific field, and second, the potentials of individual creative people. In the first case, as Seidel (1966, p. 5) suggests,

> the very time required to cope with the continued and continuing expansion of knowledge in all directions may reach a point of diminishing returns that can approach the absolute zero of mental paralysis, even of intellectual despair.

In the second case, the pressure upon and trivialization of time in personal life may well destroy a necessary condition of successful life that I have termed "creative poise." Such a condition is essentially within the control of the individual adult.

Fifty years ago, Alfred North Whitehead reminded us of an invaluable concept of time, the concept of the Sacred Present. As human actors, we are often obsessed with the failures and replayings of the past and, on the other hand, absorbed in worries about the future, while all the while the Sacred Present, in which we should live, is passing from us. It is a valuable component of actualizing creativity through the adult years to work at whatever is our creative task in the Sacred Present; this is a learnable art.

3. Turn seemingly adverse situations to account. Certainly in the arts, losses in love, pain, fear, illness, loneliness, and feelings of fragility and impermanence have been used by seeker and creator poets, painters, sculptors, etc. The ability to make use of seemingly negative situations clearly is not simply something inborn, but is learnable as a life art by the coping ego, or beyond that, by the self, as Jung often and elegantly defined it.

4. Apply the imagination. Various techniques can stimulate interest and generate fresh breakthroughs in problem-solving and in

original thinking. Mind-storming is one technique; others involve divergent or "lateral thinking" as opposed to "vertical thinking" (de Bono, 1982), the imaginative application of fantasy and metaphor e.g., Parnes (1966), Torrance (1961), unpracticed and disused techniques in the processes of combining, adapting, multiplying, magnifying, and the reverse of these, eliminating, reversing, and substituting. Strategies of combination, of the kaleidoscopic approach to fresh images and channels, can revive interests, help break inertia, and generate renewed ventures.

A humanistic exercise relating directly to the uniqueness of the person practicing it is the keeping of a personal reflective journal. Such a journal is not simply a record of life events; the word "reflective" is the key, to which one might well add the word "selective." It is a self-awakening, self-actualizing exercise with potential for greater creative self-realization to write cogently about selected happenings, ideas, and people in one's life; about insights and wisdom perhaps otherwise lost all too quickly; about glimpses of nature and human nature; about the human comedy and the human condition.

5. Apply the will. Perhaps the most powerful of all components for the processes that will cause the creatively seemingly dead or foreclosed to awaken is the action of the will. While the great Italian psychoanalyst Roberto Assagioli noted that the will is able to "hamper the intuitive function," he also wrote that

> it can create and keep clear the channel of communication along which the intuitive impressions descend. It does this by imposing a temporary check on the distracting activities of the other psychological functions.

Assagioli raised the issue of the power or weakness of the will in the success or failure of creative exploits throughout the adult life journey. The will allows sustaining concentration and may lead to the maintenance, recovery, and growth of the innate creative powers.

I note with wonder, in closing, that I have not once referred to the Ulyssean Concept as such, summed up in the Creed of the Ulyssean Society:

> As a Companion of THE ULYSSEAN SOCIETY, I am committed to the noble concept and the provable fact that men and women in the middle and later years can, if they choose to do so, richly maintain the powers to produce, to learn, and to create, until the very end of the life journey.

The concept, however, is inherent throughout this paper. Many concepts, regarding later age creativity and what I have described as the Ulyssean life from age 50 on, have remarkable parallels, although one can be Ulyssean without being especially creative, and one can be creative without being especially Ulyssean. A great joy and goal is to be both.

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Technical/Vocational and Applied Technology Programs

World First:
Technical-Vocational Education and the Creative Student

Bruce G. Milne, The University of South Dakota
Jack C. Higbee, Utah Vocational Council

For the first time in the history of the World Council for Gifted and Talented Children, a technical-vocational strand was included in their biennial conference. Bruce Milne, from the University of South Dakota, was the chair of this strand. He was assisted by Jack C. Higbee, Executive Director of the Utah Vocational Council, with encouragement from the World Conference chairman.

The technical-vocational strand was focused on the concept that technical-vocational education has a place for those students who are not too interested in regular academic programs. But, technical-vocational education is also a viable option for the highly gifted and creative. Technical-vocational education needs the highly creative students, and we found that many of the highly creative students need and seek out technical-vocational education. We can help build the image of technical-vocational education by pushing this concept and thereby encouraging more students to pursue this option as they continue their schooling.

Some 44 people attended all or part of the sessions during the two days this technical-vocational strand was conducted.

The presenters for the technical-vocational strand and their subjects were as follows:

Bruce G. Milne, Professor, Educational Psychology, The University of South Dakota — "Developing Creative Talents in the Older Student."

Donald Maley, Chairman, Dept. of Industrial Technology, University of Maryland — "Research and Experimentation: A Program for the Gifted Talented and Creative in Technical Education."

Lanny Hassell, Exec. Director, Arkansas Vocational Council — "Why Not the Total Person?"

John Felthusen, Department of Education, Purdue University - Indiana — "Developing and Using Vocational Talent Rating Scales."

Richard Maxfield, Member, Board for Vocational Ed., State of Utah — "Preparing a Creative and Productive Work Force."

James C. Durkin, Owner, Creative Learning Systems, Inc., San Diego, California

Peter Johnson, Exec. Director, Illinois Vocational Council — "Experience-Based Career Education for Gifted and Talented Students."

Ronald Fredrickson, University of Massachusetts — "Aiding Multi-talented High School Students to Make Career Choices."

Calvin W. Taylor, Professor, University of Utah — "Basic Research in Locating and Developing Multiple Talents in All Students."

Felice Kaufman, Lexington, Kentucky (Recently with the University of New Orleans) — "Career Choices and Challenges."

Panel: Rupert Evans, Professor Emeritus, University of Illinois. *Subject:* "Does Technical-Vocational Education Have a Place for Gifted, Talented and Creative Students?"

C. Brent Wallis, Director, Ogden-Weber Area Vocational Center

Joyce Winterton, Executive Director, National Vocational Council

David Gailey, Utah State Office of Education

In general, everyone who made a presentation, plus those attending as audience members felt that this initial technical-vocational strand was a success, even having some unexpected, very positive findings. They also urge that this type of strand be continued, even expanded, in all future world conferences in this series.

It was the consensus of those who participated that the technical-vocational phase of this conference was a real success and that many

talented and creative students will find a comfortable place in technical-vocational education.

Some of the conclusions from the meeting were as follows:

1. For some 10 years, considerable effort throughout the nation has been devoted toward providing technical-vocational opportunities for gifted and creative students. Bruce Milne, from the University of South Dakota, has done considerable work in this field, as has John Feldhusen, from Purdue University.

2. John Feldhusen has developed a series of rating scales to be used by technical teachers in determining creative talents in several vocational areas, including trade and industry, office occupations, and vocational agriculture.

3. There was consensus among the group that academic talent is only one talent which people have — and even this talent is broken down into several areas such as word comprehension, word fluency, mathematical ability, etc. Students have multiple talents which are very useful to them in the world of work. These include talents in relating to people, leadership talents, and the ability to take complex ideas and develop them into something useful.

4. Most of the presenters emphasized that we must apply the multi-talent concept in our teaching and we must recognize that students are multi-talented, not just academically talented.

Several papers provided by individual presenters are included in the proceedings as examples of some of the research being done and efforts being made by educators and others involved with technical-vocational education as it relates to creative and talented students.

Creative Students and Technical-Vocational Education

Jack C. Higbee, Utah Vocational Advisory Council, and
Calvin W. Taylor, University of Utah
Salt Lake City, Utah

Utah Job Service reports that most of the new and replacement jobs in Utah during the next decade will require technical-vocational education type of preparation. More specifically, there will be more jobs (almost two-to-one) that require post-secondary technical-vocational education preparation than there will be jobs that require a B.S. degree or more.

The primary focus of the education system in our state is to prepare high school students to go on to college, and at the college level, to obtain a B.S. degree. This educational focus meets the needs of a minority of Utah students, less than 25-50 percent, depending on which level you are reviewing.

Less than 50 percent of Utah students in the ninth grade will go on for further education beyond high school. Twenty-two percent drop out before they receive a diploma, and another 28-30 percent secure a high school diploma and seek no further education, at least not immediately.

Of those students (approximately 50 percent) who go on for further higher education training, some 50 percent drop out before they start their second year. Some of those who drop out may reenter the system, but at the most, only 25 percent of the students in our high

schools go on to receive a B.S. degree. Again, then, the primary focus of high school is to prepare students to go to college and the primary focus of college is to prepare students to get a B.S. degree. As a result, we have fairly large numbers of students competing for jobs that require a B.S. degree or more and we have too few students preparing for jobs in the technical-vocational education area—that is, jobs that require some skills training but less than a B.S. degree.

One of the primary reasons for this mismatch is that technical-vocational education does not have the positive image it needs and deserves. Most educators and many parents still feel that technical-vocational education is for those students who cannot succeed in a regular academic program. As a result, many highly talented and creative students whom we need as skilled workers in the future are reluctant to choose a technical-vocational path. Yet, highly talented and creative skilled craftsmen and technicians are as important as highly skilled engineers and other professionals.

In our view, Utah's industrial growth potential will be dormant if modifications are not made in our approach to preparing people for the skilled jobs in the technical-vocational area. Yes, technical-vocational education is for those students who have had little success in typical academic-type programs. Technical-vocational education is also for the highly talented and creative.

During 1986, a small group consisting of Calvin Taylor from the University of Utah, Judd Morgan from Utah Technical College/Salt Lake, Charles Losh from the State Office of Vocational Education and Jack Higbee from the State Vocational Council met to discuss steps we could take to determine if there are creative students currently involved with technical-vocational education. We discussed the possibility of a research project using a Biographical Inventory Form U developed by the *I*nstitute for *B*ehavioral *R*esearch *I*n *C*reativity (IBRIC) to locate creative talents among technical-vocational education students.

Our plans were to complete the project and to report on the results at the 7th World conference for the gifted, talented and creative in Salt Lake City in mid-August, 1987. Representatives from all over the world, as well as from every state in the Union would be in attendance and we wanted to report something of significance to relate the skills and talents of the gifted, talented and creative to the large number of students who are involved with technical-vocational education in our state.

Frankly, our goal was to help build the image of technical-vocational education by letting the world know that even though many technical-vocational students do not fit the mold of the typical high academic achiever, they are creative, productive individuals who can make a major contribution to our society, especially as a skilled part of the work force.

It was our view that business and industry would be the major benefactors if we could accomplish something in this area, because they would have available as prospective employees a larger pool of skilled, highly motivated people.

We wanted to do some basic research to identify the creative, productive thinking, leadership and other non-academic talents among technical-vocational students. We wanted to administer a highly-validated test (actually, a biographical information instrument) to some 2,000 vocational students currently studying at a local high school, at two area vocational centers and at the two technical colleges in our state. We would relate the results of this testing effort to other data available concerning these students. These other data could include ACT scores, GPAs and other pertinent information.

Our hypothesis was that many technical-vocational students are as gifted, talented and creative as any other students within the education system, but they often do not have high scores in the typical academic areas. Because the current education system places so much emphasis on academic achievement, these students often suffer from a poor self-image—being led to believe that the only true success in life comes through academic excellence. We felt that these highly creative technical-vocational students have as much, and in many cases, more to contribute to our industrial society then do the usual academic-type students.

Our overall objective was to validate this hypothesis to see if it is true.

A decision was made to administer the biographical inventory to 150 students at South High School, 125 at Davis Area Vocational Center, 155 at Ogden-Weber Area Vocational Center, 445 at Salt Lake Community College, and 425 at Utah Valley Community College. Up to and through 1986-87, the latter two were called Technical Colleges and their names were changed to Community Colleges in 1987-88.

At the high school, we worked through the principal and used the highly validated Form U. At the area technical-vocational centers, we

worked through the center directors, as well as someone involved in guidance, and at the two community colleges, we worked through the directors of the assessment centers.

A decision was made that some of the items in the Form U were not suitably worded for use at the community college level, so, working with the directors at the two community colleges, we developed a new form referred to as Form CC (*Community College*). To develop form CC, it was necessary to modify some of the questions from Form U, to delete some and to add others. It was felt that Form CC had face validity and was approximately the same as form U (as the number of modifications, changes, additions and deletions were relatively minor). It takes about one hour to complete the form.

After providing some instruction to the test giver at each of the institutions and having them read through the instruction form accompanying the biographical inventory for Form U, the test (Form CC) was actually administered by the staff at these locations.

The completed forms were then returned to the supervisory group. The forms were then turned over to IBRIC for scoring. Costs for the booklets and the computer scoring were paid by the Utah Technical-Vocational Council. The scoring key was the same for the two forms.

Our initial test group included 150 students from South High School, a high school which was closing forever at the end of the 1986-87 school year. We practiced the testing process and did initial work on a feedback report which gives only good news to each student tested of their greatest potential talent areas.

In Table 1, the results for one Community College show that 80 percent of the 445 students were above average on at least one of these four talent scores of Academic, Creativity, Arts Potential and Leadership. This is a gain of 34 percent of the results only for the Academic Talent. A total of 88 percent of this sample are above average on one or more of these six Form U scores. A total of 57 percent of this sample scored as being seven percent above average of how far they intend to go up the academic ladder.

This Technical College, therefore, has a high percentage of their students being above average on performance of the four important talent scores and an even higher percentage of their students above average on at least one of the total set of six form U scores. The average was that students were above average on approximately half of the four talent scores and above average on approximately half of the

PERCENT ABOVE AVERAGE ON FIRST FOUR SCORES				PERCENT ABOVE AVERAGE ON ALL SIX SCORES		
	%	Cumulative			%	Cumulative
4 scores	15%	15%	6 scores		11%	11%
3 scores	19%	34%	5 scores		15%	26%
			4 scores		14%	40%
2 scores	27%	61%	3 scores		16%	56%
1 score	19%	80%	2 scores		19%	75%
0 scores	20%	100%	1 score		13%	88%
			0 scores		12%	100%

TABLE 1: RESULTS ON FORM CC BIOGRAPHICAL INVENTORY
SCORES OF 445 SALT LAKE TECH COLLEGE STUDENTS (SPRING 1987)

six Form U scores. All the results in this first table support the idea that there is a good pool of high-level talented students in this college.

Table 2 was produced by combining the samples of the two Utah Technical Colleges. It showed that the total sample of 870 students was about average or above average on all of the six Form U scores except for Leadership. There is *no evidence that there is a below average group going from high schools to Technical Colleges in Utah except for Leadership.* These are not below average students, collectively, in Academic or Creativity or Vocational Maturity or Educational Orientation (but are also above average of persistence in staying through school beyond high school).

Talent	Percentile Rank
Academic	49
Creativity	53
Arts	48
Leadership	37
Voc. Maturity	63
Ed. Orientation	56

TABLE 2: A Report of Scores of the Two Combined College Samples (N = 870) on Form CC Biographical Inventories, When Compared to Standardized Norms on Form U for 10-12th Grade High School Students.

We then tested two samples at our state's Area Vocational Centers. These centers have high school students, returnees to complete a diploma, returnees to relaunch into improved career opportunities, etc.

TABLE 3:

PERCENT OF STUDENTS ABOVE AVERAGE —
50 PERCENTILE RANK CUT-OFF INTO +'S AND 0'S
(N = 155)

ACADEMIC	CREATIVITY	ARTS	LEADERSHIP		ACADEMIC	CREATIVITY	ARTS	LEADERSHIP		ACADEMIC	CREATIVITY	ARTS	LEADERSHIP	
4 pluses 30%				47	2 pluses 20%				31	1 plus 15 + %				23
+	+	+	+	47	+	+	0	0	7	+	0	0	0	3
3 pluses 20%				32										
+	+	+	0	6	+	0	+	0	5	0	+	0	0	8
+	+	0	+	8	+	0	0	+	2	0	0	+	0	10
+	0	+	+	0	0	+	+	0	8	0	0	0	+	2
0	+	+	+	18	0	+	0	+	2	0 pluses 15 − %				22
					0	0	+	+	7	0	0	0	0	22

	N	%	Cumulative Downwards
4 pluses	47	30%	30%
3 pluses	32	20%	50%
2 pluses	31	20%	70%
1 plus	23	15 + %	85 + %
0 pluses	22	15 − %	100%

The extremely exciting, high-score results were found at Ogden-Weber Area Vocational Center, as seen in Table 3. We hope a dissertation or other follow-up study can be undertaken to discover why such high multi-talented people were found going into and through that center. One strong hunch is that these people with high multi-talent potentials were seeking schooling of a hands-on and especially a brains-on experience calling for using powerful *thinking and creative brain* processes.

A total 30 percent of the sample were *above average in all four high-level talents*, whereas less than 15 percent were below average on all four talents. *This is an extremely unusually rich vein of talents to be found anywhere in high school or college or university levels.* Fifty percent were above average in three or four of these talents.

These results give the emphasis that we hoped would emerge in Tech/Voc programs, namely, that persons with talents other than academic and some even with academic talents are not really interested in trying or wanting to try to fit a knowledge-focused, highly academic talents way of acquiring and returning knowledge. The functioning powers of their brains attract them to go to other types of schooling, such as Technical-Vocational schooling. These findings were worth all the testing we did. We suspect that higher education institutions, especially four-year colleges and universities, have not yet ever thought of recruiting creative people from such sources. The next challenge is to find a workable solution that would provide each incoming student at both the Community (Technical) Colleges and the Area Vocational Centers with *awareness training* of their multi-talent potentials, after having tested them for the four major talent scores obtained from Form U. The final challenge is to be able, somehow, to activate and develop their talent potentials with multiple-talent focused teaching approaches by nationally-certified Talents Unlimited teachers in Utah.

Teaching The Gifted And Talented Through Technology Education

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Scholarship does not reside in a subject. The study of a subject becomes alive, an adventure in research, an experience in discovery, a scholarly pursuit, if the teacher has the insight and understanding to make it so.

— Vernon Anderson

This opening statement by Vernon E. Anderson is the central theme around which this discussion will take shape and form. This presentation is based on several important and highly relevant hypotheses. These are:

1. That the areas dealt with in vocational education can be an adventure in research, an experience in discovery, and a scholarly pursuit.

2. That the areas dealt with in vocational education can provide programs that would challenge and benefit the gifted and talented.

3. That the environment of the respective areas of vocational education provide unique settings for a diversity of meaningful experiences that would be valuable in the education of the gifted and talented.

As a vocational educator who has had responsibility for a number of service areas in vocational education, the value of such educational experiences for all levels of students has been quite obvious—if the teacher has the insights and understanding to make it so.

The discussion that follows will deal with a nationally and internationally known program in one of the service areas of vocational education. That service area is industrial arts/technology education.

The program is called Research and Experimentation (R&E) in industrial arts/technology education. It is a program that has attracted the gifted and talented students who normally would not have elected to take such an offering. The program has been operated at the junior high school as well as the senior high school levels. It is a program that could find considerable value in the other vocational service areas of home economics, agriculture, trades and industry, and technical education. It is a program based on the processes of learning to learn, problem solving, inquiry, synthesis and analysis, as well as strong involvement in verbal and written communication. It also is a program that bears a strong relationship with the present and future societies wherein research is and will be a dominant factor in national and international progress.

Briefly stated, in order to establish a context for the discussion that follows, the Research and Experimentation program in industrial arts/technology education is a student-centered program. It is an elective offering that has been attractive to the gifted and talented students. The students conduct one or more research projects that are of their own selection. The research procedures are consistent with acceptable practices carried out by researchers in industry and other agencies. The central focus is on the nature and quality of the processes by which the individual arrives at the solutions or answers he/she gets. It is a laboratory oriented research and experimentation program complete with written reports, constructional activities, and seminars.

The presentation of the research and experimentation program in industrial arts/technology education will proceed through a number of important dimensions associated with its conduct and development. These dimensions are: a concept of giftedness; the nature of the gifted; the role of the teacher; the qualities of the teacher; the nature of the program; reactions to the program; and the appropriateness of the program.

A Concept of Giftedness that Reaches Out to Many Dimensions of the Quality

The nature of giftedness takes on many forms. Some of these are very narrow and restrictive, thus eliminating many useful and valuable talents from consideration.

This program utilizes a broad perspective of gifted and talented similar to that expressed by Kilpatrick and Witty.

William H. Kilpatrick (1962) described the nature of gifted in the following manner: ". . . the term 'gifted' must include not only the intellectually gifted, but all who show promise in music, the arts, creative writing, dramatics, mechanical skills, and social leadership. . . ." (p. 43)

The nature and scope of giftedness was the subject of an investigation by another prominent person in the area of human capability. Dr. Paul Witty (1961), after an extensive review of a wide range of findings and opinions on the nature of the gifted pupil, concluded that giftedness should ". . . include any pupil whose performance, in a potentially valuable line of human activity, is consistently or repeatedly remarkable. This definition is being increasingly accepted." (p. 36)

Thus, it is apparent under either of the above definitions by recognized authorities that there are many opportunities for vocational education program areas to be involved with the gifted and talented.

The Nature and Characteristics of The Gifted Individual

It is important that any program of education (gifted or non-gifted) take into consideration the nature and characteristics of the learner. This idea is fundamental to good program design and instructional strategy development.

The research and experimentation program in Industrial Arts/Technology Education started with the characteristics and qualities of the students for whom the program was to serve.

Torrance (1965) listed ten characteristics of the productive, creative person as identified by a panel of experts. These characteristics are curiosity, independence in judgment, becoming absorbed and preoccupied with tasks, intuitiveness, persistence, unwillingness to accept things on mere say-so, willingness to take risks, and unwillingness to accept the judgments of authorities (p. 17). Torrance further

stated that "... This fact should give teachers of gifted children special cause for reassessing their values and goals in teaching such children." (p. 17)

Getzels (1954) identified the distinctive characteristics of the "able learner" as follows:

1. He has greater curiosity and is not content with mere rote repetition.

2. He is more exploratory and is likely to want to go beyond the limits of a particular problem or the arbitrary restrictions of a particular lesson unit.

3. He is more autonomous and is likely to want to work out problems independently.

4. He is more abstract in his thinking and is likely to want to generalize from particulars to principles.

5. He is more creative and is likely to be impelled to add something original or imaginative of his own to a given problem or classroom project. (p. 21)

As a result of study of the nature and characteristics of the students the program was intended to serve, a series of activities were designed into the R & E program that would take advantage or utilize the qualities of — independence of thinking, curiosity, independence of judgment, intuitiveness, persistence, autonomy, independence of action, unwillingness to accept judgments of others, and risk taking.

The actual observed behaviors of the students involved in the program over a number of years and in a number of schools have borne out the fact that they do in fact, manifest such qualities and characteristics.

The Qualities and Characteristics of the R. and E. Teacher

The R & E program in Industrial Arts/Technology Education requires a teacher with some unique qualities and characteristics. Observation over several years of a number of highly successful teachers with this kind of a program has revealed that such personnel must —

1. have faith in the intelligence of youth.

2. view education as an organismic process and not a splintered series of atomistic exercises.

3. conceive his/her role as one of stimulation, guidance, evaluation, and facilitation.

4. exemplify in his/her discussions and interactions with students an attitude that will stimulate new levels of refinement in the student's procedures, research and reporting.

5. be up-to-date on technological and current events.

6. be broad in his/her perspectives with respect of the kinds and forms of research a student may pursue.

7. develop a mode of thinking that is positive in the approach to problems. This is directly opposite from the manner of thinking that searches for reasons why something should not be done.

8. place procedure, inquiry and discovery above the production of things and the memorization of isolated facts.

9. have a secure feeling while dealing with students of high ability who are working with advanced levels of information that may be beyond the teacher's level of knowledge.

10. be willing to seek assistance from other teachers as well as members of the broader community.

The teacher is the pivotal point in the R & E program. Experience over a period of thirty-five years has made it obviously clear that the teacher can make or break the program. It has been shown that in several instances where there were good teachers operating fine programs and then the teacher would move or be promoted, the program would fail under another teacher who replaced him/her. The school, the environment and the students were substantially the same. It was the teacher who was the principal variable in the loss of the programs.

The Role of the Teacher is Critical In the R. and E. Program's Success

The way that the instructor functions in his/her teaching role is of prime importance.

The teacher functions as a manager of the educational processes in the R & E program. As a manager, the teacher serves as a stimulator, — always encouraging the best performance from every student. This role is to develop and promote a positive self-concept on the part of the student.

As a manager of education, the teacher makes things possible and promotes an attitude as well as an environment that enables the students to carry out their research. One part of this role is to assist the students in their resourcefulness as they reach out beyond the school,

or even the community, to secure information or equipment vital to the success of their project.

The teacher's guidance role in this context is largely individualized assistance that is given the student with respect to proper procedures and format for the conduct of the research. Some of this guidance may come as a form of questions raised by the teacher in order to sharpen the direction or focus of the student's work.

The evaluation role is one of helping the student refine and clarify various dimensions of the work being done. It also is an effort to help the student assess the appropriateness, accuracy and effectiveness of his/her work.

The good teacher of R & E is constantly aware that his/her role is not to provide answers, but to assist the student in their being able to develop the processes for getting the information.

The Environment of the Technology Laboratory is a Key Factor

The environment in which the R & E program takes place is critical to the effectiveness of the effort. The presence of a broad range of shaping, forming and constructing equipment adds an important dimension to this environment. Additional equipment that is useful in testing, measuring and evaluating materials and processes, as well as performance, contribute to this unique environment. The laboratories usually are equipped with the facilities of air pressure, vacuum, additional ventilation, a range of electrical potential (A.C. and D.C.), water and drainage.

Seminar facilities are normally included in the R & E environment as an integral part of the laboratory or as an adjoining area.

One other dimension of the environment of the R & E program is the personnel component in which the student finds him or herself in the presence of other students engaged in research. The interpersonal interaction by students pursuing a variety of researches contributes enormously to an atmosphere that is both stimulating and challenging.

An additional component of the environment for R & E programs consist of the total school in which it takes place. The physical as well as the personnel resources of the total school provide a potential environment that is invaluable for the pursuit of such a program.

Community Involvement Is A Major Element in the R. & E. Program's Effectiveness

A major premise fundamental to an effective program in R & E is the extent to which the community beyond the school is used. The basic concept is that the school becomes the base of operations out from which the linkages to the community are extended. These linkages or connections are extended to individual authorities, organizations, companies, colleges and universities. The broader community becomes a source of consultation, information, materials, and equipment. There are occasions when industries or organizations in the community may actually be a place where certain elements of a student's project may be constructed or tested.

Another very important use of the community is the influence support that one can get for the R & E program. Community backing can be a major factor in the expansion and improvement of such an educational endeavor. One dimension of strong community support that has been very helpful has come from the parents of the students in the program.

The R & E Program is Experience-Based Individualized Instruction

The R & E program can best be described by a series of single statements related to specific dimensions of the design of the experience.

The over-all goal of the R & E program is to provide an educational experience that would challenge the gifted and talented student; that would be centered on individual interests; that would blend the concrete with the abstract; that would promote the individual's development in the areas of problem solving, inquiry, learning to learn, communications, and decision making; and that would provide for a concrete experience in self exploration. See page 362 for a model research sequence used in the program (Maley, 1986).

The structure and processes involved in the program include the following:

1. It is an elective program generally starting at the ninth grade, but may, with modifications, be conducted in earlier grades, as testified to by persons working at those levels.

2. The early sessions of the program include such activities as the following:

    a. Discussion on the goals and objectives of the experience.

    b. Presentation of requirements, i.e., each student would be expected to conduct one or more research projects of their own choosing.

    c. Presentation of research procedures and elements.

    d. Discussion of the nature of the written report.

    e. Discussion and emphasis on safety in all aspects of the students efforts.

    f. Discussions on the nature and range of research problems the student may elect to pursue.

    g. Discussion and presentation of the facilities and materials available to the student.

3. The student selects a problem that he/she would like to pursue.

4. The student develops the problem presentation using standard research procedures and terminology. The elements or statements of problem, purpose, hypotheses, assumptions, limitations, procedure and terminology are formulated and developed.

    a. Background study and investigation is conducted.

    b. Apparatus and necessary test samples are constructed.

    c. The research is conducted taking into account such items as pilot runs, instrumentation, checks for reliability and validity, and organizing the data.

    d. An analysis is made of the data in order to state the findings.

    e. Conclusions are drawn with respect to the stated hypotheses.

    f. Recommendations are drawn regarding the outcomes as well as implications for further study.

5. Seminars are held on a regular basis in order to provide a system whereby the students may learn about the research being conducted by others in the class. The following statements describe the nature and function of the seminars.

    a. The seminars are conducted by the students and each is under the leadership of a student who serves as a chairperson.

    b. The seminars have a structured agenda designed to get optimum participation on the part of each student.

    c. The students are encouraged to assist each other with problems they may be encountering.

EDUCATIONAL OBJECTIVES	PROBLEM IDENTIFICATION	PROBLEM DEVELOPMENT	BACKGROUND DEVELOPMENT
Problem Solving	Areas of Interest	Problem	Library Research
Resourcefulness	Alternative Problems	Purpose	Consultation
Independence	Tentative Problem	Need	Visitation
Communications	Firm Problem	Hypothesis(es)	Correspondence
Leadership		Assumptions	Phone Calls
Inquiring		Limitations	Experimentation
Technical Content		Terminology	
Manipulative Abilities		Procedure	

CONDUCT OF RESEARCH	ANALYSIS OF FINDINGS	CONCLUSIONS AND RECOMMENDATIONS	EDUCATIONAL ATTAINMENT
Research Design	Data	Hypothesis	Problem Solving
Instrumentation	• Organization	• Support	Resourcefulness
Facilities	• Analysis	• Reject	Independence
Pilot Run	• Evaluation	Problem(s)	Communications
Main Study	• Observations	• Answered	Leadership
Checks for	Findings	• Unanswered	Inquiring
• Reliability	• Identification	Recommendations	Technical Content
• Validity	• Evaluation	• Additional	Manipulative Abilities
Data Gathering	• Projection	Research	
	• Validation	• Next steps	
		• Application	

FIGURE 1. MODEL RESEARCH SEQUENCE
Maley, Donald. *Research and Experimentation in Technology Education.*

d. The seminars provide an opportunity for the students to challenge each other with respect to procedures, data and conclusions.

e. The seminars are frequently the occasions when visitors from the school, other schools, and the community come to observe bright young people discuss their work.

6. A written report is drawn up by each student for every research he/she has conducted. The format of this report is similar to that used in formal research presentations at the graduate and post-graduate levels.

7. The final phase of the program involves an analysis and discussion of what has been learned and goals that have been achieved.

Parental and Student Reactions Have Been Most Favorable

The R & E program in Industrial Arts/Technology Education has won a great deal of attention as well as praise from all who have had the opportunity to observe it or participate in this unique educational experience.

The initial conduct of the program at Montgomery Hills Junior High School (Montgomery County, Maryland) in 1959, created some confusion in the minds of the parents of students in the class. They had expected their children would be carrying out the usual constructional activities. The research and experimentation program involved a different kind of project. It also involved a different form of involvement on the part of the student. However, this confusion was completely eliminated when the parents attended a back-to-school night where they received a thorough explanation of the course. The reaction was immediately favorable and has continued to be so with parents of the many students who have gone throughout the course.

Surveys were conducted of the parents from time to time to get their reactions to the program. The following are some of their comments about the program.

- "We are more than pleased with (sans name) year in I.A.R.L. We think it was and is an excellent opportunity to turn young minds loose to follow where they will. We endorse it highly."
- "I like this approach to education (not confined to Industrial Arts) and wish it were used generally."
- "It has been a wonderful experience for (sans name) and we are deeply appreciative of the help and guidance he has gotten

here. He has talked about it and has been encouraged in his school work in general because of it. We feel that it has been an influence of great value.''

- ''The program contributes positively to the growth and development of boys, as it provides the opportunity to do something creative for which recognition and satisfaction are possible. Our sincere thanks for this opportunity afforded to our son.''

There are several important points made by the parents of the students in the program, such as: . . . an excellent opportunity to turn young minds loose; . . . has been encouraged in his school work in general because of it; . . . contributes positively to the growth and development; and . . . it provides opportunity to something creative for which recognition and satisfaction are possible.

The students have expressed their very favorable comments on a number of occasions. The following are some statements from them.

- ''This is what makes school worthwhile.''
- ''This is why I come to school.''
- ''The research and experimentation program helps me in my other school subjects.''

When one of the young researchers was asked why he knew so much about his subject, he replied, ''I read everything I get my hand on.''

During the Summer of 1984, a special two-week program was conducted in the Department of Industrial, Technological and Occupational Education at the University of Maryland, College Park. This was a research and experimentation program in industrial arts/technology education for a special group of 12 gifted and talented students in grades 9, 10 and 11. Each of the ten working days was crammed with research activities, speakers, field trips, seminars and a broad range of constructional activities. Each of the students carried out a complete research project, including writing a report.

The students' comments during the last session of this two-week program were as follows:

- helped me realize how much fun it is to work with tools and test equipment
- program should be in every school across the nation
- it makes learning fun
- will do my best to get the program in my school
- feel proud of myself for what I accomplished at the University

- the program is a worthwhile learning experience
- recommend you involve more students in the program
- more time be alloted for this program
- thoroughly enjoyed being a participant in the program
- had a great time
- program would be very instrumental in the school system
- allows students to combine different skills
- learn about something the student wants to learn
- program should be offered to the average student too
- if you do it next year, I'd love to do it again
- thank you for this experience
- thanks for the privilege to participate in the program
- thanks for providing us with this wonderful program
- believe me, I will try to motivate Mr. _____ (teacher at his school).
- enjoyed the well organized program
- thanks for two weeks I'll never forget
  Other themes or comments included:
- expression of appreciation for being in the program
- being able to select their own problem for study
- being permitted to work on their own
- used equipment I never used before
- experiencing education that was fun
- an enjoyable and enriching experience, although a short one
- this Summer the best I ever had
- helped me to prepare for college
- teaching me to research on my own
- how to document a report

Another form of feedback has come from former students who are now professional and successful people in a variety of careers. They are quick to attest to the value of the program of research and experimentation in industrial arts/technology education.

The program represents a model that puts educational theory into practice. It is based on the finest of theories regarding the adaptation of teaching to the individual needs of the student. It is a program of relevance in an age or period in which research is a dominant factor in change as well as in progress. Perhaps most significant of all, it starts with the qualities and characteristics of the learner and then applies specific strategies to achieve appropriate goals for education in the present society.

The numerous service areas associated with vocational education are fertile fields for such a program. The breadth and scope of potentials for challenges to bright and gifted students in vocational education are endless. The problem of implementation centers around the issues of perspective, imagination, and desire to carry out such a program.

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The Use of Technology
in Working with Gifted Children

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In 1973 Prof. Joao Carlos Di Genio, from Centro Educacional Objetivo, became interested in working with a certain group of students whose outstanding performance had showed him that those students needed special treatment. Before he started recommending, always in their academic program, he decided to check on what other countries were doing about their gifted children. After coordinating several visits to different countries, the work done in Israel under Prof. Erika Landau's supervision was chosen as a sample of what takes place in a developing country with characteristics similar to Brazil's.

The first step of implementing a new approach at Centro Educacional Objetivo was to take the most gifted students out of their usual groups and put them together in a special group. The objective was to provide them with the kind of development that could be compatible with their needs. This experiment did not prove to be efficient. The students showed a lot of competitive feelings about each other and they also felt like outsiders in their own school. It was decided to offer enrichment programs based on each student's needs and interests. At first, they were special programs that could supply the stu-

dents with a lot more information than they got in their regular curriculum.

Those first experimental steps showed that there was still a lot to learn and to do about working with gifted children. A team of psychologists and school teachers was formed and the work with gifted students started taking up a more definitive shape.

In August, 1986, the Centro Educacional Objetivo promoted a Seminar on Gifted children, in order to raise questions and bring up a deeper discussion about the matter among people working in the same field. We invited some international specialists: Prof. Joan Freeman from the Manchester University, England; Prof. Dorothy Sisk from the University of South Florida, United States; and Prof. Erika Landau from the University of Tel-Aviv, Israel; as well as representatives of the state educational institutions in Brazil.

The results of the Seminar were fantastic. It raised interest in all kinds of people, from specialists to students and their families. This showed us that there is a lot of potential to be explored in this area in Brazil and we are only just beginning.

The technological aspect of the work was also considered at this point. Several professionals from Objetivo were sent to Israel, France, Bulgaria and the United States, in order to update our technological resources.

The next step was then to design the identifying model of the assessment for gifted children and to organize advanced programs. The identifying model that was developed consists of a detailed screening of all the students in the school. There are almost 80,000 students at Objetivo all over Brazil. We started working unit by unit. We considered the results of intelligence tests and teacher's evaluation cards.

After this screening, the selected students were given a psychological check-up and sent to a family orientation program. This psychological check-up and family orientation program can be offered to people from other schools as well.

The advanced programs offered at present consist of courses on: (1) Microelectronics, (2) Robotics, (3) Computation, and (4) Arts.

1. In the Microelectronics course, the students work with plates which are Microcomputers with limited memory capability. These plates can be programmed and they show the students how a computer works. Several situations of the children's everyday life are re-

produced at the laboratory, such as: electrical appliances, traffic lights, etc. These simulators are built by the children themselves with standardized pieces which permit several setting strategies. The simulators are then linked to the plates that have already been programmed by the students.

2. The Robotics course teaches students how to build robots with the same standardized dovetail pieces. The robot's projects are made initially by drawing or wood and paper models, and then they are programmed through the computer in order to perform tasks linked to everyday life activities.

3. In terms of Computation, the students are taught artificial intelligence programming courses through Logo language and the necessary foundation for the use of computers in several areas.

4. The Arts classes go from simple practical activities, with materials like ink, paper, glue, etc., to more sophisticated products through our computer.

All these courses are given to small groups of children from 7 years of age on. The teacher's attitude about the course is a very informal one; they play the role of a monitor more than that of a teacher.

The school is also opened to groups of older students who frequently get together, motivated by some experiment that they are developing. This was the case with some engineering students who designed and built a little airplane.

On August 12 to 14, the C.P.T. Objetivo is organizing a new Seminar on gifted children, at Maksoud Plaza, Sao Paulo.

Information about this work can be obtained in Sao Paulo, Brazil from Prof. Marilia Ancona Lopez or Prof. Almir Brandao by telephoning 289-0971.

Developing Creative Talents in the Older Student

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In 1977, I directed a nationwide program through the U.S. Office of Education which brought together representatives from Vocational Education, Guidance/Counseling, and Gifted Education in five regional conferences. Each state and territory sent five representatives to one of these conferences to launch the Vocational Education of the Gifted program. Since that time, much has been done in research, publications, and program development throughout the nation. Now it is time to bring our theme and advancements to the world audience of educators of the gifted.

There are those in our nation who are reluctant to encourage highly capable, gifted students into such educational alternatives. Many still see vocational preparation as an alternative for the average and less capable student. Yet, the future of our nation's business, industry, agriculture and general advancements in scientific/ technical/ high technical pursuits depends upon getting the more highly capable persons into the action arena as early as possible. Many of our vocational and technical educational institutions provide excellent training to give our most capable students this opportunity. Many gifted and high ability youngsters are enrolled or have received superior vocational/technical opportunity. Many gifted and high

ability youngsters are enrolled or have received superior vocational/technical preparation from such institutions and are immediately employed in highly demanding positions in business, industry, health care services, public services, and many other related fields.

It behooves us all not to dabble in this excellent opportunity to remove some of the public bias against strict career preparation which counsels, guides, and encourages gifted students into only academic preparation. With adequate support, the American and world delegates will be confronted with the power and feasibility of giving students encouragement to take a serious look at preparation programs which will allow them early entry into productive fields of employment through vocational/technical training.

Let me emphasize that the following are my conclusions after many years of looking at the gifted/talented/creative students in relation to vocational education:

- Vocational/Technical Education is a viable alternative for Gifted/Talented/Creative students at the post secondary level.

- Vocational/Technical Education institutions in the United States attract and prepare many high ability students each year in their respective programs; generally, however, the student enters vocational/technical preparation "against the grain" of parent, counselor, and peer pressure to succeed in solely academic pursuits.

- Many high school students of high ability and/or gifted and talented students are "counseled out" of vocational/technical preparation by parents, teachers and guidance people largely in favor of four-year baccalaureate schooling.

- Internationally, many educational systems require a matriculation examination at about the 6th or 8th years. If the achievement score is not suitable, the student is taken out of the academic track and placed in a vocational track which subsequently places lower ability (academically) students in the "lesser" option — vocational preparation.

- Many vocational/technical preparation courses are sufficiently challenging that they demand a superior student to fulfill the rigorous requirements.

- Many gifted and talented students often find themselves unable to attend four-year baccalaureate degree institutions, even with scholarships and minimal financial aid. Vocational/technical preparation work lasting two years or less allows the student to enter employment earlier and at higher salaries, in addition to fulfilling the skill needs of business and industry.

- The public, including educators, is basically uninformed as to the program quality in our vocational/technical/high technical preparation institutions. Widespread awareness efforts are needed to remove the old ''shop'' and ''practical arts'' image of programs tailored to service the average or less capable student. This is universal in nature.

Rating Scales for the
Identification of Vocational Talents

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The Purdue Vocational Talent Scales

The four scales of this battery are designed for talent identification in secondary vocational classes. An appropriate scale should be completed for each student whom a teacher feels is talented in the particular vocational area. If a student has taken classes from several teachers in an area, the several teachers should each complete one of the rating scales.

These scales are based on the assumption that the best way to identify talent is to observe student performance and to make judgments about the quality of the performance. Teachers completing these scales are urged to recall specific instances of behaviors which are relevant to each rating item. In the absence of behavioral evidence the teacher should rate the item as uncertain.

Each student who is nominated and rated by one or more teachers should rate him or herself with the same scale and the self rating should be included in the packet of talent identification material for the student.

Students who score 50 or higher as rated by one teacher or as an average among two or more teachers should be selected for assign-

ment to the school's talent pool. For each such identified student a growth plan should be prepared by a committee of vocational teachers suggesting appropriate future classes for the student, other in-school activities, out-of-school projects and activities, and special activities or adaptations which should be made in teaching the student in vocational classes.

These procedures for identification of vocationally talented youth and instructional activities which are provided for them should all be viewed as a part of the school's total gifted and talented program. Similar identification of talent should be carried out in the arts and academic areas using the Scales for Rating The Behavioral Characteristics of Superior Students (Renzulli et al. 1976).

These scales are based on systematic research in which vocational teachers' judgments and information from literature reviews were combined to write scale items. Vocational teachers then reviewed all items and judged their appropriateness and clarity. The results are presented in the thesis of Jill Dayton (1986, Purdue University), in a technical report available from the authors, and in a content validity report attached to this copy of the scales.

Research Draft developed by
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VOCATIONAL AGRICULTURE TALENT IDENTIFICATION SCALE

NAME OF TEACHER _____

DATE _____ GRADE _____

NAME OF STUDENT_____

GPA IN VOCATIONAL AGRICULTURE CLASSES_____

TOTAL SCORE ON THE SCALE _____

READ EACH STATEMENT AND RATE THE STUDENT ACCORDING TO THE FOLLOWING SCALE:

5 — Strongly Agree   3 — Uncertain   1 — Strongly Disagree
4 — Agree   2 — Disagree

1. Shows great mechanical skills in use of tools and equipment.
2. Shows creativity in adapting or modifying designs or plans when necessary.

3. Is able to stick with a project and see it through to completion.

4. Shows great interest in new techniques and methods.

5. Exhibits leadership in shop activities / organizations.

6. Is able to develop the design for a project.

7. Asks appropriate or insightful questions to clarify a task or project.

8. Comes up with good, high-level ideas for a project or for agricultural problems.

9. Is viewed by other students as showing talents in agriculture classes.

10. Learns and applies new skills, techniques, or procedures rapidly and easily.

11. Makes good judgments or evaluations.

12. Is able to present ideas about a project clearly and effectively.

13. Understands new ideas and concepts quickly and easily.

14. Seems to have a lot of ideas.

15. Is enthusiastic in all or most class activities.

BUSINESS AND OFFICE TALENT IDENTIFICATION SCALE

NAME OF TEACHER _____

DATE _____ GRADE _____

NAME OF STUDENT_____

GPA IN VOCATIONAL AGRICULTURE CLASSES _____

TOTAL SCORE ON THE SCALE _____

READ EACH STATEMENT AND RATE THE STUDENT ACCORDING TO THE FOLLOWING SCALE:

5 — Strongly Agree   3 — Uncertain   1 — Strongly Disagree

4 — Agree   2 — Disagree

1. Shows great skill in organizing data and information.

2. Shows creativity in solving problems or designing reports.

3. Is able to stick with a project and see it through to completion.

4. Shows great interest in new material, new procedures, new projects.

5. Exhibits leadership in class activities / organizations.

6. Is able to develop a design for a project.

7. Asks appropriate or insightful questions to clarify a task or project.

8. Comes up with good, high-level ideas for a project.

9. Is viewed by other students as showing talent in business and office classes.

10. Learns and applies new skills, techniques, or methods rapidly and easily.
11. Makes good judgments or evaluations.
12. Is able to present ideas about a problem or project clearly and effectively.
13. Understands new ideas and concepts quickly and easily.
14. Seems to have a lot of ideas.
15. Is enthusiastic in all or most class activities.

HOME ECONOMICS TALENT IDENTIFICATION SCALE

NAME OF TEACHER _____

DATE _____ GRADE _____

NAME OF STUDENT_____

GPA IN VOCATIONAL AGRICULTURE CLASSES _____

TOTAL SCORE ON THE SCALE _____

READ EACH STATEMENT AND RATE THE STUDENT ACCORDING TO THE FOLLOWING SCALE:

5 — Strongly Agree   3 — Uncertain   1 — Strongly Disagree

4 — Agree   2 — Disagree

1. Shows great skills in use of equipment / materials.
2. Shows creativity in adapting or modifying designs or plans when necessary.
3. Is able to stick with a project and see it through to completion.
4. Shows great interest in new techniques and methods.
5. Exhibits leadership in group projects / organizations.
6. Is able to develop a design for a project.
7. Asks appropriate or insightful questions to clarify a task or project.
8. Comes up with good, high-level ideas for a project or for procedures in sewing and cooking.
9. Is viewed by other students as showing talent in home economics.
10. Learns and applies new skills, techniques, or methods rapidly and easily.
11. Makes good judgments or evaluations.
12. Is able to present ideas about a problem or project clearly and effectively.
13. Understands new ideas and concepts quickly and easily.
14. Seems to have a lot of ideas.
15. Is enthusiastic in all or most class activities.

TRADE AND INDUSTRIAL TALENT IDENTIFICATION SCALE

NAME OF TEACHER   _____

DATE _____ GRADE _____

NAME OF STUDENT_____

GPA IN VOCATIONAL AGRICULTURE CLASSES _____

TOTAL SCORE ON THE SCALE _____

READ EACH STATEMENT AND RATE THE STUDENT ACCORDING TO THE FOLLOWING SCALE:

    5 — Strongly Agree   3 — Uncertain   1 — Strongly Disagree

    4 — Agree   2 — Disagree

    1. Shows great mechanical skills in use of tools and equipment.

    2. Shows creativity in adapting or modifying designs or plans when necessary.

    3. Is able to stick with a project and see it through to completion.

    4. Shows great interest in new techniques and methods.

    5. Exhibits leadership in shop activities/organizations.

    6. Is able to develop the design for a project.

    7. Asks appropriate or insightful questions to clarify a task or project.

    8. Comes up with good, high-level ideas for a project or for shop procedures.

    9. Is viewed by other students as showing talents in trade and industrial education.

    10. Learns and applies new skills, techniques, or procedures rapidly and easily.

    11. Makes good judgments or evaluations.

    12. Is able to present ideas about a project clearly and effectively.

    13. Understands new ideas and concepts quickly and easily.

    14. Seems to have a lot of ideas.

    15. Is enthusiastic in all or most class activities.

CONTENT VALIDITY

Items in each scale were reviewed by vocational teachers for their appropriateness in identifying talented students. They were also rated with regards to their clarity. The ranges of response were:

Appropriateness
1. Very inappropriate
2. Inappropriate

Clarity
1. Very unclear
2. Unclear

3. Appropriate
4. Very appropriate
DK Don't know or have never
observed

3. Clear
4. Very clear

Agricultural

Appropriateness
N = 7
X = 3.15
SD = .83

Clarity
7
3.19
.88

Business and Office

Appropriateness
N = 30
X = 3.24
SD = 1.01

Clarity
30
3.33
.91

Home Economics

Appropriateness
N = 28
X = 3.55
SD = .86

Clarity
28
3.44
1.03

Trade and Industrial

Appropriateness
N = 24
X = 3.15
SD = 1.05

Clarity
24
3.26
1.03

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Reforms in G/T and Other Educational Programs

Talents Unlimited:
New Directions in Teaching
Higher Order Thinking Skills

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The topic of thinking skills instruction is a familiar one to educators of the gifted because the most persistent emphasis on teaching higher thinking skills has been reflected in literature regarding education of highly able students. The names of widely used teaching-learning models, such as Bloom's (1956) *Taxonomy*, Guilford's (1956) *Structure of the Intellect Model*, and Taylor's (1967) *Multiple Talent Approach to Teaching* strike familiar notes. New national reports on student abilities have led to the mobilization of new forces for the teaching of thinking to *all* students. This national emphasis on teaching all students to think creatively and critically fits in well with intiatives in gifted education to treat certain kinds of enrichment as appropriate to all students; but we have "miles to go and promises to keep" in terms of providing effective thinking skills instruction.

This paper will summarize some of the major issues in effective thinking skills instruction and suggest some promising leads to solutions. The role of Talents Unlimited, a model which was designed to develop multiple types of high level talents and which has provided leadership in thinking skills instruction will be described in the context of issues discussed.

There are at least three major topics which researchers use to focus discussion about obstacles and solutions to effective thinking skills instruction: (a) defining thinking skills, (b) teaching thinking skills, and (c) evaluating thinking skills. The following sections summarize some major issues for each topic.

Defining Thinking Skills

Researchers in thinking skills instruction agree that some definition of skills is necessary but the level of precision in defining skills is still open to debate. Beyer (1984a) argued that lack of clarification about what "thinking" means in terms of specific skills has led educators to inconsistent efforts in helping students improve their thinking; further, he said that the diverse terms we use to refer to the same skills is confusing to students. Beyer (1984b) recommended the clear identification of a core of thinking skills with precise definitions of the procedural components of each skill, a task which he suggested builds on the taxonomic approach provided by Bloom and his colleagues.

Writers such as Sadler and Whimbey (1985) argued that taxonomic approaches may break skills into such discrete units that they work against the student's total intellectual functioning. They suggested that effective thinking skills instruction is more than "quietly performing discrete behavior" (p. 200); rather, they emphasized a holistic approach to thinking with the teaching of skills embedded in active communication about whatever problem solving methods students choose to use; this communication emphasis focuses on helping students become question-raisers, on encouraging the articulation of students' thinking, and on providing a great deal of feedback to students about their thinking.

Teaching Thinking Skills

There is little disagreement that thinking skills should be taught but the literature reflects differing viewpoints with regard to how instruction is implemented. Many writers agree with Beyer (1984a) that teachers spend less time on specific instruction in using certain thinking skills and more time in putting students in situations that require them to perform that skill to the best of their ability. Even when teachers consistently use certain thinking skills models to ask ques-

tions at different levels of cognitive ability, they often do not move past the asking stage to actual instruction in the execution of skills.

Although researchers may disagree on how thinking skills should be defined, there is strong agreement that effective thinking skills instruction must account for systematic use of skills in all content areas. Sternberg (1985) pointed out that the underlying assumption of this position is that ability to use skills in one subject area does not guarantee success in applying the same skills in another content area. While a few proponents of thinking skills instruction propose a separate course in the teaching of thinking, most writers disagree; Bereiter (1984) suggested that such an approach may guarantee that thinking skills instruction will continue to be regarded as a frill in the school program.

Beyer (1984a) pointed out that many school programs have relied on textbooks to provide guidance in what thinking skills will be addressed and how they will be taught. This approach tends to emphasize the quantity of skills students may be introduced to and the net result is often skills overload. In this approach students may have no more than one or two formal encounters with any one skill. Research indicates that learning a skill to any significant level of competence requires more than one encounter. This is particularly important when considering the higher order cognitive skills that educators of the gifted give so much attention to. It is unlikely that students will use creative and critical thinking skills independently or spontaneously without sufficient practice over a period of time.

Evaluating Thinking Skills

Much work remains to be done in addressing thoroughly the topic of thinking skills evaluation. A major point of concern is the issue of testing isolated thinking skills versus testing sequences of cognitive operations. Beyer (1984a) identified this concern as stemming largely from a problem of conceptual inadequacy—i.e., a failure to acknowledge that basic processes such as critical thinking or problem solving involves sets of skills and that testing isolated skills is inadequate in assessing these broader cognitive processes. Further, our reliance on standardized tests to assess thinking skills has revealed another flaw: that professionals who develop tests of thinking skills often do not share with the teachers who provide instruction in think-

ing skills descriptions or models of skills that they use in constructing test items. Without such sharing, thinking skills instruction in the classroom is bound to result in inconsistent, random effort.

Costa (1984) suggested that effective assessment of thinking skills instruction must go beyond standardized, norm-referenced tests. He outlined an alternative involving keeping anecdotal records of student performance based on observation of certain behaviors: (a) persevering when solution to a problem is not immediately apparent; (b) decreasing impulsivity; (c) flexibility in thinking; (d) using metacognitive skills; (e) problem posing, as well as problem solving; (f) transference beyond a specific learning situation; (g) precision of language; and (h) enjoyment of problem solving. His recommendations are based on the belief that product assessment should be not what answers the student knows but how the student behaves when he or she doesn't know.

The Talents Unlimited Model for Teaching Thinking Skills

Talents Unlimited (TU) is a teaching-learning model for thinking skills instruction; it represents a classroom level, research-based implementation of the Multiple Talent Approach to Learning (Taylor, 1967). The model features four major components: (a) a description of specific skill components in productive thinking, decision making, planning, forecasting, and communication; (b) model instructional materials which demonstrate the function of the talent skills in enhancing academic learning; (c) an inservice training program to assist teachers in the recognition and nurturing of students' thinking abilities; and (d) an evaluation system for the assessment of student development in thinking skills. The following sections illustrate how the TU model addresses some of the issues raised by researchers of thinking skills instruction.

Defining Thinking Skills

The TU model specifically defines sets of skills which make up each talent or broad thinking ability (see Figure 1). These definitiions are intended to be instructionally useful in that they focus on observable behaviors. The overlapping or linking of one set of skills with another is recognized and encouraged. For example, students who use productive thinking to generate a set of possible topics for a survey are encouraged to move on to decision making to narrow the

field of alternatives, and then, to planning to work out the details for subsequent implementation. This model of thinking skills is considered to be dynamic and interactive.

Teaching Thinking Skills

One of the major tenets of the TU model is that students should be actively involved in efforts to improve their thinking skills. An important part of that involvement is teaching the model—i.e., making youngsters aware of what multiple talent development is and how the TU model works. The initial effort to teach the model involves the use of a bulletin board or display of some kind as a vehicle for a brief and simple explanation of the concept that people have different kinds of "smarts" or talents; the discussion of the different kinds of smarts or talents is accompanied by models of people using the skills of the various talents.

Helping students understand the function of each of the multiple talents and learn the specific skills that make each of the talent clusters operational is further strengthened by the use of Kid Talk charts (see Figure 1). Kid Talk represents months of effort in working with students during the initial research and development period to simplify and refine the operational definitions of the talent clusters with language that students could understand and use. These strategies are an important part of the developmental process of transfer of skills, i.e., being able to use skills independently in contexts different from the ones in which skills were learned originally.

One aspect of the rationale for instructing teachers in the stematic use of specific skill component cues for each of the talent clusters is related to evaluation of student performance. When teachers understand and use specific skill components in their instruction, they are more likely to identify those skills when they occur in students' performance and they are able to differentiate students who are making progress in thinking and those who are not.

In the TU model, teachers are encouraged to provide students with models of the various talent clusters. Teachers use their own creative and critical thinking efforts as a personal model for students. For example, when a teacher explains a project she wants the class to undertake, she can also describe how she used her decision making talent to select the project. This kind of "thinking aloud" serves as a model for the skills being taught to students. In much the same way,

teachers encourage peer modeling. In the discussion following the use of a talent cluster, the teacher asks the students to describe aloud the way they use a particular skill or the strategy they employed to get through a difficult place in the activity (e.g., how to shift into another category or viewpoint). When students are encouraged to think about their own thinking, metacognitive abilities are being tapped.

In the review of issues in teaching thinking skills, insufficient practice of selected skills and isolation of skills from one another and from subject matter were identified as major concerns. The TU model is based on the concept of developmental growth of students' thinking skills. Many of the classroom examples provided in the training model detail the differentiation and variation of the thinking skills instruction (Schlichter, 1986). The initial research results on the TU project reflected the need for long-term instruction before significant results can be attained. Most adoptions of this thinking skills model provide a minimum of two years of systematic guided practice.

One of the concepts that emerged quickly during the early development of the TU model was that students vary in their use of certain talent skills across subject areas. Apparently, students' preferences and aptitudes for certain subject areas interact to some extent with their skill in using the talent clusters. Based on that observation, plus the goal of demonstrating to students the usefulness of the talent clusters in all areas of academic study, activities were written and implemented so that all subject areas were tapped by each talent cluster with approximately equal frequency. Talent Activity Packet (1974), as well as curricula developed by adopters of the TU model, reflect the integration of talent instruction in all subject areas.

The TU model can be useful in a variety of ways to teachers in programs for gifted students. Like many other teaching-learning models designed to enhance higher order cognitive and affective skills, this instructional model can be implemented as a support system in assisting gifted students as they uncover and solve problems of interest to them. Specifically, the talent thinking skills can be focused to assist students in developint inquiry skills needed to pursue the investigation of a problem or the development of a special product, and they can be used to help students develop the skills necessary for organizing and managing the implementation of such activities.

Evaluating Thinking Skills

The TU model employs both formal and informal measures to assess student growth in thinking skills. The Criterion Referenced Tests of Talents (1974) is a battery of 10 measures developed by the project staff and a university research team to assess changes exhibited by students in each of their talent areas. Equivalent forms are available for both elementary and secondary students; tests must be handscored by trained evaluators.

Teachers who are trained in the TU model learn to assess student talent development informally through observation of specific behaviors keyed to the 19 skills reflected in Figure 1. Simple procedures for "eyeballing" the results of lessons employing talent skills allow the teachers to compare students within class groups; this kind of daily awareness of student progress assists in refining instruction in specific thinking skills for individuals and small groups of students.

FIGURE 1. KID TALK

Productive Thinking
1. Think of MANY ideas.
2. Think of VARIED ideas.
3. Think of UNUSUAL ideas.
4. ADD TO your ideas to make them better.

Forecasting
1. Make many, varied PREDICTIONS about a situation.

Communication
1. Give many, varied SINGLE WORDS TO DESCRIBE SOMETHING.
2. Give many, varied SINGLE WORDS TO DESCRIBE FEELINGS.
3. Think of many, varied THINGS THAT ARE LIKE ANOTHER IN A SPECIAL WAY.
4. Let others know that YOU UNDERSTAND HOW THEY FEEL.
5. Make a network of ideas using many, varied, COMPLETE THOUGHTS.
6. Tell your feelings, thoughts, and needs WITHOUT USING WORDS.

Planning
1. Tell WHAT you are going to plan so someone else will know what your project is.
2. Tell all of the MATERIALS AND EQUIPMENT you will need for your project.
3. Tell, in order, all of the STEPS NEEDED to complete the project.
4. Tell the varied PROBLEMS that could keep you from completing this project.

Decision Making
1. Think of many, varied things you could do. ALTERNATIVES
2. Think more carefully about each alternative. CRITERIA
3. Choose one alternative you think is the best. DECISION
4. Give many, varied reasons for your choice. REASONS

Summary

Research on effective thinking skills instruction reflects some disagreement on the level of precision in defining skills; but there is general consensus on the importance of systematic guided practice of skills and on the integration of skills with a variety of content areas. Issues in the evaluation of thinking skills focus on the need for more communication between test developers and teachers and for the use of both formal and informal measures of thinking skills development.

The Talents Unlimited model effectively addresses many of the issues in thinking skills instruction. Its emphasis on student involvement in the use of specific skill language and in communication about the application of skills in all content areas demonstrates the importance of direct instruction in thinking skills. This model has special promise for schoolwide enrichment efforts as a vehicle for teaching students of all ability levels to think creatively and critically and for providing highly able students with specific tools of inquiry for independent investigation.

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Thoughts And Suggestions
For Educational Reforms

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My report starts from when I was the first Director of Personnel at NASA, which was created as an out growth from its predecessor organization, NACA (*N*ational *A*dvisory *C*ommittee on *A*eronautics), I had a major responsibility of selecting scientists and engineers and the first sets of astronauts during NASA's initial growth period. My NASA experiences lasted for over twenty years.

Next I directed a Personnel Research Program in the Smith Richardson Foundation in Greensboro, North Carolina, which expended over a million and one-half dollars with excellent results and productivity. One of our contributions was providing starting-grant funding for the *I*nstitute for *B*ehavioral *R*esearch *i*n *C*reativity (IBRIC) in Salt Lake City. Another contribution was to fund a five year creativity-researcher awardee program (one awardee/year) in the *A*merican *P*sychological *A*ssociation (APA). The first year awardee was J.P. Guilford of USC, whose 1950 APA Presidential Speech on Creativity has been the mid-century landmark for initiating serious scientific research on creativity. We also held national research conference on biographical inventories as predictors of later career performances (Henry, 1965) and on criteria for research and for research application in management, leadership, and creativity (Henry, 1967).

Since then, as a national consultant with an organization of my own, I have called for the development of a National Talent Bank for the great talent resources in our population and for Education to take advantage of the National Talent Bank by selecting and developing the high-level brainpower talents needed nationally by business, industry, government, and education. Another approach I emphasize is that schooling should be transformed into apprentice training for students to learn to function more fully and effectively by developing more of the essential characteristics needed for successful life careers.

The first section of my report is on developing both criteria of creativity and new testing measures for the selection of high level personnel. The second section covers my beliefs of what's wrong with the present education system. The last section indicates the direction in which education should be changed.

Creativity in the Selection of Personnel in NACA/NASA

During World War II, the story was that if Einstein had been working for the U.S. Government, the most he could have attained would have been just one or two steps above the entrance federal salary level. In his work he didn't supervise anybody and his job had none of the characteristics that counted for going up the well-defined government salary ladder. There was a crying need to provide two-ladders-up by adding a second salary ladder all the way up. Then, without being a supervisor, an individual scientist making highly creative contributions could go to the top pay-scale without all these other supervisory responsibilities and accompanying attributes.

We knew that we had to do something about identifying a *highly creative research product* and to describe it in a way that the United States Civil Service would recognize it for pay and for other purposes. That was quite an assignment! We asked hundreds of scientists: "What is a highly creative product, and how could you characterize it or describe it? How do you recognize a creative contribution when you see it?" For example, I remember one very young scientist who said, "Well, a creative solution is one that is not obvious but is correct."

As we studied all the comments that scientists had given, we noticed numerous examples of top contributions which we considered to be highly creative products. To us, some products offered as examples proved to be useful narrowly, and only for one particular problem, but *didn't* seem to help in solving any other problems.

In contrast, the highly creative contributions that we particularly noticed not only resolved the single problem in question but were useful in providing help in answering other problems as well.

We derived a principle that the wider the range of problems that the solution helped solve or was applicable to — the more creative the product was considered to be. This came to be known as *the breadth of applicability principle,* namely, that *the broader the applicability of the particular product, the more creative it is — and conversely.* No one had, at least up to that time, conceptualized the idea that a realistic way to identify a creative individual is by his products.

While it seems like an oversimplified type of definition, we have found that it holds up very well, at least in the R & D work in the physical sciences. Einstein's special relativity theory is probably one of the most creative contributions. It has a very broad application, as I understand it, and underlies almost all physical and chemical phenomena. Therefore, it has a very broad breadth of applicability. This principle of applicability breadth works pretty well — well enough that we were successful in clearing a salary path all the way to the top of the pay scale for scientists who worked creatively but alone.

So *here was our chance to improve our staff if we could find some method of identifying creative people at the level of college graduation.* There is not much chance in many fields for an individual to make any creative contribution at the undergraduate level.

By going into the military camps, we found and selected some 4,000 persons who had appropriate degrees, took them out of uniform, and put them into a *NACA* laboratory for the remainder of the war. *Since most of these people were not carrying transcripts around in their pockets, their grades did not generally become involved in the selection process.* This proved to be particularly fortunate. So we had an unusual opportunity about three or four years after the war to study the relation of grades to research success. The scientists had spent three to four years of their careers at NACA and they had had a chance to survive and prove themselves, or not, as scientists.

We worked to obtain the college transcript of all the journeymen level researchers at one of our large research centers. We wanted to know what was the relationship between grades and career performances in our organizations. We found a zero correlation (.06) between college grades (ranging from 4.00 downward to several persons with GPA's less than 2.00). Yet these latter persons averaged as well in their level of research accomplishments as all the remainder of the

sample who had GPA's above 2.00 (see the Table 3 in Taylor, Smith, and Ghiselin, 1963). It was very apparent that we were getting as many creative people from the bottom quarter of the college class as we were from the top quarter.

Later in the 1950's, Hughes Aircraft made a fairly large study of the college grades of its research scientists, with larger samples than ours. They found *no relationship whatsoever* between college grades and occupational success of research scientists. Furthermore they evaluated the colleges; they gave more weight to MIT grades than to Podunk grades, and they still found no relationship whatsoever. *On the promise of secrecy*, I have seen three or four other unpublished studies and they all come out the same way—no relationship whatsoever. These results have been *well-kept secrets*—known practically only to those businesses and industries that have done such studies. But they have kept these results secret to avoid upsetting their relations with the well-established educational institutions in the nation.

This situation of minimal or no relationships between schooling and careers also occur in graduate schools, in professional schools, in prestigious colleges and universities, and in non-prestigious colleges and universities. Along the same vein, when the zero results found in the two organizations above were reported to a gathering of educators on the west coast, an audience member commented that within the educational establishment, *those findings of zero relations must be the best-kept secret of all within education*!!!

The day may now have arrived when these secrets should be told openly and widely, from both sides. This would set the stage for improving the academic programs to increase greatly the correlations between the nature of education's schooling and the nature of world-of-work careers. Wellness between the educational staff members and the student clients whom they serve would be improved as would the relations between applicants-for-work and personnel interviewers and selectors in businesses and industries also be improved.

Ed Henry of Standard Oil said that it is a waste of time to do any more studies trying to find an important, significant relationship between college grades and anything occupational. John Stalnaker, the founder and president of the National Merit Scholarship program, said, "The traditional measures of scholastic aptitude are of little or no value in predicting creativity."

Because of these many findings and forces in education, there is widespread discrimination against the 75% of the population who have moderate or low grades and thus are denied access to educa-

tional opportunities. Such individuals are denied entry into scientific and other professions and are also excluded from most positions of leadership in this country.

The results from occupational selection practices present a sad picture. Our most extensively used selection methods in education don't validate—and even education itself doesn't validate beyond itself.

The nation spends more money on education and selection than any other one thing and education is apparently unrelated to anything in the real world. The defensiveness of education and of occupational selection experts is: "So maybe they don't work very well but we have no alternative other than to continue to use what we are doing until something better comes along. After all, the nation has resorted to drawing numbers for military draft selection."

The question has now become, *can we do better than chance or random numbers in making our selection decisions in education and occupations?* At least chance and random numbers are unbiased and do not discriminate unfairly against minorities and subgroups.

Using Biographical Data as a Predictive Device.

The principle underlying the use of biographical data as predictors is that past behavior is the best predictor of future behavior. Biographical type of scores are almost always better predictors of the future than a combination of traditional measures. A Biographical Inventory is a collection of multiple choice items which allow individuals to describe themselves in terms of their past life history. Most of the items deal with the person's past actions but some are interest or value judgments.

The Utah team that used biographical inventory scores to test all NASA scientists and engineers had processed hundreds of biographical items to finally end up with the 150 items which worked best. By using an alternative-item analysis, a key is made based on the item choices which differentiate high criterion performers from low criterion performers. A summary report of this type of research on biographical inventories is presented in Science by Taylor and Ellison (1967). Biographical inventories have improved prediction of job performance over chance by as much as 40 percent.

From these results and other biographical studies two clear conclusions can be reached:

Conclusion No. 1. Biographical inventories for occupational performance criteria *do validate* and at the same time *do not discriminate against the culturally and educationally deprived groups.*

Conclusion No. 2. *Talents are distributed evenly among all groups of persons regardless of race, sex, color, or income level.*

So here is a selection methodology which provides a very *substantial improvement over chance selection and does not discriminate against minorities* (Ellison et al., 1972; Ellison and Fox, 1973; Ellison et al., 1973; and Fox 1972).

NASA is keenly aware of the value of announcing their spin-offs back-to-Earth from their efforts out in Space. An unbiased private concern known for its evaluation of organizational accomplishments did an independent evaluation of NASA's spin-offs-to-Earth. The winning program was NASA's Communication Satellites which enable the transmission of information from one part of the world through NASA's space satellite to wider regions back to the Earth almost instantaneously. The winner of second place was given to the Utah biographical studies of NASA's nation-wide scientists. This led to the identification of more creative scientists from other scientists, and thereby increased the scientific insights about creative people.

It is up to other organizations to develop and validate their own selection measures. This is a better prediction than that achieved by compliance with the requirements of equal employment opportunity. You also better seek help on the performance measurement problem or you won't be able to achieve the reasonable relationship required. The biggest problem in establishing this relationship is not with developing the prediction instrument, especially a biographical inventory. Your most pressing need first is to find out how to validly and reliably obtain criterion measures of products and/or performances—and then you can build your biographical inventory and score it to produce valid predictions of the criterion measures of products and/or performances.

What is Wrong with the Present Traditional System in Education?

Academic Talent has been found to have no relationship with the level of occupational success after college. The present educational system is based on the *false* premise that the amount of knowledge a person has once learned is related to adult performance and achievement.

The overwhelming emphasis in education on the pure acquisition of existing knowledge negates independent thinking and creativity in students. If the present educational system were specifically designed to stamp out inquiry and creativity, a better job could not have been done.

The system by which students are selected to advance through school and into college is based almost exclusively on academic talent and intelligence measures, both of which are essentially unrelated to adult achievement. Creative talents and leadership talents are also unrelated to academic talents.

As a result of this heavy emphasis on academic talent in education, students in the bottom 75% of academic talent have little chance to complete college and therefore almost no chance to enter the professions and most positions of leadership.

Thus seventy-five percent of our persons with creative and leadership talents are denied access to the professions and to most positions of leadership.

My research in NASA and in the Foundation has now made it possible to make early identification of the non-academic talents such as creativity, leadership and others. The identification of these real life talents now makes it possible to retain in the educational system those students with real life talents. Such clear identification also provides a basis for adapting education to the enhancement of these traditional non-educational talents.

The research has also demonstrated that the poor and deprived have aptitudes and talents in the same measure as those who are wealthy, academically talented, and have had educational and cultural advantages. The presently used academic and intelligence measures discriminate unfairly against the educationally and culturally deprived.

The broadest and most cruel discrimination by the educational system is against the great majority of students who do not happen to have or care to use their academic ability which is meaningless-to-careers.

In direct contrast to present beliefs and practices, real life abilities seem to be distributed evenly, regardless of race, creed, nationality, color, sex, or social origin.

Future Directions for Education.

Most of the persons presently in education will never accomplish these changes. Creativity characteristically goes against what is gener-

ally believed, so teachers, supervisors, and parents should encourage or at least tolerate contrary proposals.

Inquiry should be the basis of the educational process, not the learning of facts. Research has demonstrated that the inquiry approach to education actually results in more fact learning than does the present system. Especially at the college level, the educational process should be a work-study combination of activities—much more of an apprentice type of experiential way of developing students to develop their inner potentials. More emphasis should be placed on acquiring the tools and skills needed in occupations such as reading, writing, and arithmetic. Auxiliary skills such as typing, computer operation, and statistics should be emphasized.

The faculty should be experienced occupational practitioners preferably working in their occupation part-time and being faculty part-time.

Students should be evaluated on their work products, not on how much information he or she has (temporarily) learned.

Students should be self-taught as much as possible.

The acquisition of knowledge should be accomplished by self-teaching techniques.

The college student should have freedom of choice on what he or she wants to work on and what help is needed from the faculty. The same concepts of work-study described at the college level should be extended downward into the secondary and primary education.

So *never* say you were *never* told.

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Editor's Note: Also see Lacklen, Robert (1973) Creativity in the Selection of Personnel. Mimeographed volume, pp. 322-347, available in Calvin Taylor's office.

Do Professional Schools Select Those Who Would Be the Best in Their Professions? Definitely Not!

Dominic Albo, Jr., William Gay, Patrick Bray,
and Douglas E. "Clipper" Jones[1]

A panel of four insightful and relevant research-informed professionals discussed the tremendously important question "Do professional schools select those who would be the best in their professions? They all agreed that the answer is *"Definitely Not!"* They each reported and then discussed the unresolved issues in this unsolved area among themselves and with the audience. The panel consisted of four physicians; the first three are medical faculty members and the fourth one, Clipper Jones, adds his report below. He covers the selection and educational effects, including pressures for grades, on the lives of premedical and medical students, and also on their lives during their residency years where they are physicians-in-training. Not often do those running schools know much about what is really happening

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1. The first three were from the University of Utah School of Medicine, They were Dr. Albo, Associate Dean of Medicine, and a key researcher on the major Utah research studies of the performance of physicians-in-training and of physicians-in-practice in their careers; Dr. Gay, Chairman of the Department of Surgery and leader of the very effective Utah Heart Transplant Team; and Dr. Bray, Professor in Pediatrics and Neurology. The fourth member was Dr. Jones, an elected studentbody leader during medical school who had finished his residency training just before the 1987 conference.

to the students in that schooling, so it is worth reading and listening to what Clipper Jones has to say.

In general all four professional persons were quite well acquainted with the overall findings from selection research into academic professional schools across a variety of professions. This includes the relationships between both current selection methods and grades in professional schools with later professional performances of persons in professional careers.

When the answer came out from the panel as *Definitely Not*, this then means that people being selected into professional schools will become *some of the best*, *some of the most average* and *some of the worst professionals*. (For evidence on this point, see the References at the end of the paper by Clipper Jones.) *So let the buyer-person or the buyer-organization beware*!!

People in practically all professions essentially join the profession upon graduating from their professional school. It is troublesome if a motley group instead of a highly effective group of relevantly selected persons with appropriate attitudes and capabilities are entering the professions each year. So by graduating a motley group and sending them into the profession, such professional schools are cheating their profession, and in turn, their profession will be cheating its clients.

This is *definitely not a healthy nor a wellness situation* for many, many people. It is *certainly not* for all those selected to become professionals who do *not* turn out to be among the best professionals in practice and *not* for their clients. Nor is it a wellness situation for all those applicants who would have become among the best in professional practice but who were *not* accepted into medical school — nor for all the clients whom they would have served.

One approach emerging in this conference is to develop more of the total brainpower and more of the whole person during the K through 12 years. Likewise, the professional schools could recommend strongly to their pre-professional training sources to develop more whole-brain and whole-persons. In that way applicants can be selected on functioning talents and personal attributes that are more relevant to professional careers. This would be quite sound even if the professional schools remain largely focused on having their students learn library knowledge by using their academic talents instead of professional-practitioner talents.

THE EFFECTS OF GRADE PRESSURES ON THE TRAINING OF PHYSICIANS

Douglas E. (Clipper) Jones
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Having just completed my 3 years of residency training in Internal Medicine at the Illinois Masonic Medical Center in Chicago, I've been asked to dust off my not too distant memories of medical school and of residency experiences and to share them with you. (I suppose entering a *professional school* represents to parents a somehow worthy accomplishment and aspiration for their child.)

What are my credentials to be before you, teachers — who can influence a child more than anyone except their parents, many of whom have earned doctorates by research rather than by enduring four years of professional school. I have published no research. I have no children. No one has ever labeled me as "gifted."

Basically, I *survived*. I survived the pre-medical years and the admissions process to the medical school I attended; I survived four gruelling years during medical school; and I have survived and completed my residency. And while I was surviving, I thought, I noticed, and I questioned.

While vice president of my medical school class, I was concerned about the pressure for grades that felt so oppressive. We had one suicide attempt that I knew about plus other rumors. A reference to Price and Taylor's work at Utah caught my attention in an issue of *Psychology Today* that pre-medical and medical school grades as well as MCAT scores correlate zero (.00) with multiple measures of physician performance. This led to letters between me and Taylor, and then followed by Taylor's visit to meet with key school administrators and student leaders at my medical school. He provided confirmation by his research of the "intuitive" feelings of our medical students that grades on timed, multiple choice tests should not be the ultimate criteria in deciding *whether or not* a medical student should graduate from medical school and become a physician.

Editors Note: In our initial exchanges by mail and by telephone, "Clipper" Jones caught my attention so strongly with his challenging issue that when I was consulting at a nearby city I managed to visit his

medical school to discuss his issues with key medical school administrators and elected medical school studentbody leaders. Theirs was one of the comparatively few medical schools that were still dropping students out of medical school and therefore out of becoming a physician with poor academic performances, i.e., poor medical school grades. At that session the studentbody leaders said to administrators that you will be doing any students with poor medical school grades a favor to have them seek another career if you have evidence that their low school grades will predict that they will *not* become good physicians. But if such grades have *no predictive validity* and do *not* foretell that low grades predict validly that they will be become poor physicians, then you have no basis for discontinuing any of them by dropping them out of medical school training and out of becoming a physician.

That issue could and should be a real challenge to administrators of professional schools and the nature of their selection and educational programs which determine the quality of the people they produce and graduate to join the profession. This could and should be most true for any professional schools in any field who flunk people from their profession solely for low grades after they have already selected them into their professional school.

Admissions Processes

The emphasis on grades can best be seen in the admissions process into medical school. Can anyone enter medical school? Before the golden age of medicine, pretty much anyone who finished college and wanted to care for the sick could gain entrance. Only the motivated would put up with the years of training required. Then, after such discoveries as penicillin, medicine in our nation entered its "golden age." (I use the word golden with all its connotations.) With the new prospect of wealth added to prestige, familial approval, and job satisfaction, many more began feeling motivated to endure the 7 to 10 years of post-college training — and the number of applications soared.

How does a committee select who, out of this pile of applications, gets selected, and then face the hard feelings both of disappointed applicants and of any of their colleagues whose sons or daughters were turned down? And perhaps even occasionally face law suits? Letters

of recommendation? They usually reflect the skill of the letter writer, and the fact that the student could be likeable. We used to know who were the good recommendation letter writers and we would be especially nice and attentive in their classes. It was a game.

Interviews, perhaps? They prove someone can sustain a good first impression for fifteen minutes. Our pre-med advisor would rehearse us, even using videotaping. It is a learnable skill, but does it predict quality of performance as a physician? I think not. Possibly one's "curriculum of life?" Published research probably does indicate future performance in this research arena. When we learned that the committee considered a record of volunteer work in a health care field as a good factor, we all went out and did volunteer work. Our pre-med advisor even helped us find openings. She was proud of her record of consistently high percentages of her students accepted to medical school. No, our records of activities merely reflected our determination to jump through whatever hoops were set before us.

Well, how about pre-medical grades? Here in front of the administration committee was a yearly pile of applications with good letters of recommendations, good records, good notes from two or three interviews. How to decide? If they list the students by their grade average (or by the intimidating term of their "composite score") then the committee begins to have a handle on the problem. No longer are the subjective impressions, with the subsequent self-doubts there to haunt. This is more defensible to colleagues. Grades provide a way out of a tough predicament of selecting *not who gets in, but who gets turned away*. (Instead of such heavy weights on grades I'd almost rather see them use a lottery.)

Quality Control in Medical School

I hope this gives you increased insights into the dynamics of how and why grades have reached such prominence in selection into medical school. To me professional schools might try to select more persons who as professionals will have a "Heart for Service."

A direct extension of this emphasis on grades is their use for *quality control* once in medical school. I was surprised to find that the process of tight quality control, once we were admitted into the "Great Fraternity," did not stop. As a consequence, the cutthroat pre-med pressures and attitudes were not laid aside once we had survived the weeding process of admissions. But once I was in medical

school, my fraternal memories are of a handful of us trying to keep each other awake during the late night studying, and of our celebrating the survival of each exam at regular six week intervals. But only those of us who survived celebrated.

I saw good people two years into medical school, with accumulating time and tuition debts invested, who were *asked to leave.* Were they dismissed because they lacked compassion? Or were they unethical? Was it because they couldn't think, couldn't analyze or problem solve? They had obviously done acceptably on the MCAT national admissions exam. No, they had failed a skill we called the ability to "sponge up and regurgitate." Admittedly, that is a handy skill in present schooling. But is it essential for a professional in practice? A research investigator trying to cover a large volume of literature review would use this prior to forming a question for his latest research project. It helps in covering thick textbooks and in wading through journals. However, I've yet to see a patient with multiple choices appearing on his abdomen as I examine him. *I think we lost some good future doctors who were flunked out during those first two years of medical school.*

Grade pressure did accomplish two things. It brought our second year national board scores up, which increased our state legislature's approval and funding. Secondly, it motivated us to study harder than ever before.

We needed that. We had been trained during pre-med to study for fear and for survival. Rarely did we read to "become a good doctor" or from enjoyment of discovering the mysteries of life. Our motivations were to survive.

How will this affect our desire to keep abreast of the new medical developments of the future? Once the pressure to pass knowledge exams is gone, will we suddenly become "professionally" motivated? In a few years I'll be able to answer that for my own life. Right now, I can merely hope so. Quality control on the front end may well be driving the final quality as professionals in the opposite direction. *Motivation!*

Effects of the Present Approach

My expertise on these issues consists of what I have experienced. I have seen the admissions and quality control processes select for certain types of people, especially the good grade makers, who can learn

in detail and perform on exams (increasingly multiple guess, rather than essay).

I have also seen how these pressures select for behavior, especially in the still malleable freshman/sophomore personality. The cutthroat attitude toward grades is scary. That someone would want an honorable goal so badly as to actually destroy a fellow student's chemistry experiment by secretly adding a handful of chemicals, or hiding another's book, to ensure a higher grade for himself, is a sad thought, but a juicy piece of gossip. A rare occurrence, certainly, but a potent seasoning spreading a flavor to all who hear. Maybe only one incident a semester, but all begin thinking "I must fend for myself, no one else can be trusted." "Should I help this person who is asking for help in understanding the material? It will just hurt me." "Should I help?" This rationalization is especially attractive when the student is busy and under pressure. (And imagine the paranoia when a lab experiment fails, or all your fruit flies die.) "I'm so busy, should I help?"

The end product is a group of survivors, who will persevere, regardless of the cost: studying, avoiding social involvement, avoiding student government involvement, avoiding involvement in community program opportunities, such as Big Brothers, Young Life, student leadership positions, tutoring disadvantaged children, etc. "There just isn't the time. I have to study."

My point is that this process and its pressures seem counterproductive. The research alluded to by Dr. Bray on the panel suggests that those who are most involved in voluntary programs, such as those just mentioned above, are the ones who are most likely to become the "movers and shakers" — the ones who will have an influence on the world around them.

The Professional Importance of a "Heart for Service"

When Taylor invited me to a conference on the Gifted and Talented, I didn't quite know what to think. If I had been invited to speak on diabetes or emphysema, I would be much more comfortable. While focusing on the words *gifted* and *talented* I happened to watch Shirley MacLaine's story entitled *Out on a Limb*. An *impressive* story — for here a rather unique gift or talent is being developed to its full potential. To avoid offending any New Age proponents, I'll leave my comments to that. A few weeks later, I saw Mother

Theresa's life story. This changed my perspective. Not known as a particularly gifted child, she has gone on to help more people than probably anyone in this room.

The word gifted must include the ability to give, to care. It cannot just be academic or musical skills. The scripture "to whom much is given shall much be required" provides a good perspective. Development of potentials must be with the goal of serving others, the ability to emotionally care and find ways to meet needs, sometimes finding new and innovative ways to meet needs never previously attacked. However, *still at the center*, more than just a sense of self-achievement, *should be a heart for service*.

We take the oath of Hippocrates at the close of medical school. Then it is somewhat forgotten; not directly violated, but rather, buried in our busy lives, failing to enter into our day to day thoughts. Men such as Dr. Livingston or Dr. Burkitt in Africa—where are they today? Admittedly, Africa has changed, but so have the pressures on the selection of future physicians.

These pressures go against those with a heart for service. Those who give too much time to such volunteer work pay a price in terms of time spent away from studying, resulting in damage to the all important "grade point average." Those who want to serve but whose studies preclude such activities can feel frustrated. They can then become calloused to deal with the frustration. Those who finally gain a heart for service late in their training or ever afterwards may have gained an advantage; but these persons are usually in their thirties, facing pressures to raise a family, somewhat set in their ways. These factors go against effective change at that stage of life.

My Residency Experience

In my residency training it was common to see physicians who rushed to get through their rounds. Those who had that extra compassion, often seen late at the hospital, sometimes torn between patients and marital pressures, stood out by comparison. However, they were generally "overshadowed" by those who could quote the recent journal articles or make the wisest (or otherwise entertaining) remarks at conferences or bedsides. Imagine considering a physician being "slow" as a negative attribute. Marcus Welby would certainly fail as a role model. Strange! Imagine hearing of a surgery chief resident bragging of the commitment and dedication required at her pro-

gram by claiming that by the end of their second year, all of the married residents were divorced. Strange, sad perspectives.

I don't mean to sound too negative. Most physicians are dedicated, hard-working professionals who care for their patients and want to get them well. However, strange attitudes emerge when service as the central goal is replaced by a focus on something else for minutes, hours, or years.

I saw this most clearly in my own life when, a year and a half ago, I made the diagnosis of cancer that others had missed. (Someone else would have made the diagnosis in a day or two, I'm sure.) Anyway I was elated! I had solved the *puzzle*. I was a good clinician. I had *achieved* something. *Elated*. Then I was at the bedside when the patient was told he had cancer. Being proud of myself clashed head-on with sympathy for whom we as yet could offer no help. Strange attitudes when a heart for service isn't central.

Solutions

I frown on criticizing when constructive suggestions are lacking. I wish I had more tangible valid programs of selection and training to implement. I merely have my impressions of the process of becoming a physician in the 1980's. Other professions could perhaps outdo the horror stories. The sample of medical school faculty here on the panel has shown, through this conference and through previous research, rare insights into the problems. Those of you who are Utah taxpayers can perhaps encourage further research in validating (or disproving) such impressions as this. I'm unaware of similar work in Illinois and Tennessee at present (and would welcome enlightenment in the matter).

I would propose two general directions. First, let us generally encourage those seeking to find a better selection process for professional schools, ways to predict and select, as well as produce good physicians (or other professionals) by trying to define and refine our image of what makes a good physician or other professionals.

Secondly, until that has been accomplished, consider ascertaining the *minimum* standards and abilities of absorbing and comprehending medical sciences to survive medical school and perform safely as a physician. Then consider something like a lottery for those who meet these acceptable standards. This would avoid the stigma of being "not quite good enough to get in," where *good* refers to skills in-

volved in obtaining high grades. This would decrease the pressures leading to cutthroat attitudes in the late formative years. This might allow *good* physicians to matriculate into the profession, where *good* includes the heart for service.

As the "golden age" of medicine draws to a close, this problem may correct itself as the number of applicants drop and *motivation* perhaps becomes more altruistic. But what we learn here will be applicable as an approach to the "golden age" of MBA, engineering, or whatever is ascending.

Perhaps, also, we can then concentrate on how to encourage the *development of a heart for service*, in a rather self-centered world.

Thank you for hearing my thoughts. I hope, above all, that should I be blessed with children, they will somehow be influenced in a *good* direction by your efforts here this week and by the book of proceedings to be published afterwards.

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A Plan For Identifying And Maximizing Children's Best Abilities

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Can you imagine an engineer having enough nerve to stand here before you this morning and making many strong and unusual statements concerning needed reforms in education. Let me also say that one must know about and believe in the facts stated below before understanding how to improve our system of education.

1. Academic IQ (AIQ) and Creative IQ (CIQ) are quite unrelated, almost essentially unrelated. Only about 5% of the students you now select to enter your Gifted Children's Program now belong in your program! That is, only high CIQ students should be admitted after they have been tested for and have already found that they have a high CIQ creativity.

2. "The Only People Who Have Substantially Improved Our Lifestyle, Since 1790, Have Been The Inventing Scientists".

    (a) Skromme studied these 12 Qualities of Life in 1790 (of the very wealthy) as regards to; "Music, Opera, Architecture, Foods, Theater, Poetry, Literature, Ballet, Clothing, Furniture, Paintings and Sculpture", and found that these elements of our lifestyle have shown little improvement since 1790, the year that the first U.S. legislation on patenting occurred. This was before the U.S. Patent Office was officially created in 1802 in the Department of State, transferred to the Department of In-

terior in 1849 and finally to the Department of Commerce in 1925.

(b) The only people who have greatly contributed to the gigantic increase in our standard of living since our patent legislation started in 1790, have been the inventors and a few inventing scientists! It has not been the Bakers & Candlestick Makers, or the Teachers & Preachers, or the Writers & Dancers or the Tailors & Sculptors!

(c) Practically all improvements in our Quality of life have come from inventions of machines, chemicals, medicines, transportation methods, electricity and electronics, etc.

3. Neither do they need a high AIQ, but they must have a deep knowledge of their subject, and a very high CIQ. The very best inventors, of course, are those with scores of over 130 in both CIQ and AIQ.

(a) By interviewing and studying inventors, I found that many great inventors had only an eighth grade education or less: Edison (1,019 patents), Le Tourneau (over 300), Lundell (over 200). Lately, many others have quit college to invent, including Steven Wozniak, inventor of the Apple Computer.

(b) Einstein studied little in his general courses. He usually skipped classes outside of his major interest in physics and math, using others' notes to obtain a passing grade. For this reason, he was not permitted to study for his Ph.D. Later, by going elsewhere, he earned a doctorate at the University of Zurich. He did not even memorize his own telephone number, not wanting to fill his brain cells with information stored elsewhere.

(c) Practically everything taught today is history . . . looking backwards. That is needed up to grades 8, but not much beyond.

4. "People With High AIQ Make Themselves Rich".
"People With High CIQ Make The World Richer".

(a) Read Dr. Terman's famous work, "1,528 Little Geniuses and How They Grew." These students were studied throughout their lifetimes . . . they all had IQ's of over 135, some over 180! However, they were not tested for their creative ability, which naturally turned out on the average to be just slightly above average. When they were surveyed later in life, these "1,528 Little Geniuses" had obtained a grand total of

only 235 patents, less than the total number of inventions per person, for many inventors with 8th grade or less years of schooling.

However, Terman's students "made themselves rich". . . their average income was over four times the national average! And, 77 of them were listed in "American Men and Women in Science, and 33 were listed (inventors and seldom given any such recognition, and are often looked down upon by those with high AIQ's!)

(b) Inventors (with high CIQ), have patent protection for only 17 years, after which the world can use their ideas "for free."

5. Current Traditional Gifted children's Programs only select more Terman students who make themselves rich, and do little to make the world richer! *Our extra "Gifted" tax money should be spent only on students who will make the world richer.*

6. "Public Laws should be Passed Prohibiting any Public Money to be Spent to Hire Researchers with a CIQ of less Than 130" . . . Billions will be saved!

(a) Today, out of 100 researchers, only a small amount have a CIQ of 130, because they have been selected almost solely on grades and on intelligence IQ score. To me, all researchers, not just a small percent, should have a CIQ of over 130.

(b) the country that does this first and quickest, will not have to worry about competition from other countries.

(c) We need Search Departments, not Re-Search Departments.

7. "One Can Select Creative Students Just About as Well by Determining Who Can Throw a Baseball the Farthest as One Can by Selecting the Student With the Highest Grades . . . or AIQ". Dr. Frank Newman, now President of the Education Commission of the States (of U.S.A.) has found 13 studies that show:

(a) Grades and IQ do not predict who will be successful in creative work. Calvin Taylor has been a leader in this research. Newman's book is: "Higher Education & the American Resurgence".

(b) Grades and IQ do not predict leadership. Dr. Charles Tutt, Dean of the General Motors Institute, also found that of the top 9 GM executives, 3 were from the top of their class, 3

from the middle, and 3 from the bottom of their class. He continued researching, and found that in their 39 executives, 13 were similarly found in each group!

(c) In fact, grades and IQ only predict how well you will do the next years in school and how well you will do in work that requires the same skills as used in school, like the non-administrative work in occupations such as accounting and research in law, history, etc.

8. "Our Present Education System, in Many Ways, Hurts More Students Than It Helps."

(a) Today, as shown by Meeker and Taylor, only 20% of the students graduate from High School with feelings of confidence (those who have received A or B averages). The other 80% (with grades of C+ to D & F), leave school with neutral or inferiority feelings . . . for 12 years every report card and every test paper has pounded their inferiority into their minds, because they have been graded on only one type of intelligence. This is wrong! Someday the future Valedictorians should be those with the highest CIQ's, not AIQ's!

9. We need an all new system of grading and education for our children, to identify and improve ALL of our students' abilities . . . not just their AIQ (Academic IQ). Such a new system is presented herein, based on the excellent early research done by Calvin Taylor, chairman of this world-wide conference, and by Darrel Allington and J.P. Guilford. This plan gives over 85% of our children a feeling of confidence.

10. "Therefore, To Us It Is Apparent That A Reliable Test For Creativity Is Needed Immediately." (Editor's Note: apparently they are unaware that at least one thoroughly developed, *valid* test for creativity already exists.) — —otherwise, we have no way to identify creative students at age 10, so we can help cultivate them and greatly increase our supply of inventors . . . and other creative people.

University of Iowa Research—Dr. Nicholas Colangelo understands this urgent need, and he is developing such a test by testing only proven creative people . . . 35 great inventors . . . 20 from Skromme's book and 15 from other industries, including 4 from the National Inventor's Hall of Fame. Skromme's inventors contributed over $14,000, and this work is now in its second year. More funds are desperately needed.

11. Our Education System May Reduce Our Students' Creativity And Increase Their Dogmatism.

Iowa State University Research—Dr. Donald Schuster wants to determine if dogmatism increased and to what degree, if any by our education, and how to improve our system. Research is barely underway, but funds must be obtained soon for this 15 year program.

12. We need to advise our students of their Best Eight Abilities (or talents) by age 10, and urge them to begin to select a career.

These discoveries above made it evident to us that:

1. We are selecting our designers, our research scientists and our Gifted Children on the *WRONG* basis . . . we are using their AIQ (grades), whereas we should be using their CIQ to select such important people.

2. Thus, thousands of our scientists and design engineers are not qualified to conduct research! Laws need to be passed to prevent the continuance of our poor current practices. Dr. Paul Torrance discovered the same thing in his "Sad, Sad Frances" story.

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I thought and re-thought about this situation in education. To me, it seemed that nobody had been successful in having any really new and good ideas adopted extremely widely throughout U.S. education in the past 30 years or more! I therefore decided to attack this situation from a different angle, by pretending to be a Personnel Manager!

Why should schools use a different grading and evaluation system than the personnel directors use when they eventually hire these students . . . isn't this silly? Most educators still believe, as some have done for 2,000 years, that the students with the highest grades will always earn the most money, fill the top jobs and will always do the world the most good. . . . we all know that is not true! It is time to change!

So, I sat down as if I were a Personnel Manager and listed the things I would like to see in a student's report card to help me decide whom to hire. After much erasing, I ended up with this list of eight abilities.

1. AIQ—the knowledge test scores and grades the students who are now applicants received.

2. CIQ—Creativity—the most important type of intelligence.

3. DIQ—Manual dexterity, such as carpentry, musical instrument, sculpting, auto mechanic, dentistry, etc.

4. EIQ—Empathy, one's ability to understand thoughts and feelings of people, and even the "feelings" of machines, as inventors do so well.

5. IIQ—Interest IQ. We must consider a student's preferences. We should therefore test all students at about the age of 10 to learn their interests, and test them again each year.

6. JIQ—Judgment, common sense. This is similar to Meeker's Evaluation, Convergent and Divergent Thinking, and to Taylor's Decision Making & Planning.

7. MIQ—Motivation.

8. PIQ—Personality—How well people like you, trust you and respect you, and how well you can influence others.

If we test students at age 10 for all eight of their abilities and repeat this (re-testing) study every school year thereafter, they will greatly increase their self-confidence. This is because 85% or more will have a score of B or better in their best ability.

Now let's step back and consider this list of abilities.

FIRST, does it make the personnel manager happy?—I certainly think so. They will have 8 scores to use in analyzing a person instead of one. I plan to send this list to at least a dozen personnel managers in the next few months to get their opinions.

SECOND, will it make the students happy?—When they find out that over 85% of them will receive a grade of B or better in one of these abilities, they ar bound to be pleased. Furthermore, they will soon understand we are trying to help them plan their careers. We are starting a great humanistic movement here, not just an educational movement...we are going to treat students in a democratic way, not force them all into a common mold, as communists do.

I felt so depressed one day when thinking about all the wonderful children who had excellent scores in Personalities, or Empathy, or Judgement or in Creativity, but who felt inferior because they did not have top grades, that I told a group:

"Our education system hurts more people than it helps!"

THIRD, will it make the teacher happy?—Well at first I suppose most teachers will throw up their hands and say it is too complicated and we don't have tests for it. However, once they understand the full program, I think the teachers will be happy, because they are now going to make more students happy, and mold them into better people. The students will tend to drive themselves, once they select a career or occupation. I have talked to a lot of teachers who are sick

and tired of our current education system. They know that the students who get the highest grades don't always earn the most money and do the best for the world.

FOURTH, have we made the college entrance supervisor happy? —well, that is going to take a lot of work—right now it is so easy for them—all they have to do is to look at one little 3 digit figure, the SAT score. They are going to be upset when we hammer at them to drop their current requirements for admittance, and admit many students who have only a C-grade average or SAT score, providing they have high grades in other abilities.

I visited one great engineering school and tried to get them too adopt new courses in creative engineering, physics, chemistry and biology. Everything was fine until I told them they would have to admit some students with knowledge grades of C or below, providing they ranked in the top 1 out of 500 in creativity. It didn't take the school long to tell me *"No"*!

Editor's Note: Due to length restrictions the following list is answered in another article by the same title (Skromme, 1988, *Illinois Council for the Gifted Journal*, Volume 7, pgs. 42-45):

Now—How Do We Implement This Program?

Nine Benefits From This New Program. Who Will Be The First In The World To Test This New Plan Of Education?

New University Curriculums Are Needed.

New University Curriculums For Creative Students.

And the last two sections are: Someday . . . This Will. Skromme is also writing a book to be published, hopefully soon, titled: *Creative Students are God's Neglected Children*.

Editor's Note: Several years ago we met with a very wealthy president of an internationally known organization who liked the idea of a *College for the Creatively Talented* as identified by high scores on our Creativity Biographical Inventory. He committed money in six figures for each of three years. However, the small state university designated as an experimental university failed to live up to the organizational and ideal concept that they envisioned and they never received their funds for the second and third years.)

Should Educators of the Gifted And Talented Be More Concerned With World Issues?

Annemarie Roeper
Roeper Review
Bloomfield Hills, Michigan

Gifted education has come of age. It has become legitimate and it is here to stay. This conference, the Seventh World Conference, bears the most obvious witness to this. I have been able to follow the gifted education movement since its infancy. It can be proud of itself. It was difficult for the educational community and the general public to accept the fact that the gifted have special needs. Retarded and handicapped children obviously need help, but "the gifted are over-privileged by nature" was the general opinion.

It took great dedication by many people to make the needs of the gifted visible. So many obstacles had to be overcome: How do we identify gifted? Who are they? What are their educational needs? How do they differ? How can one provide for them? The next question was to accommodate the creative child within the concept of the gifted and a latecomer after that was that the gifted are also emotionally different from others. At this point, psychologists, counselors and psychiatrists began to become knowledgeable about the gifted. The needs of the gifted in different social economic groups, different ethnic groups, different countries became evident.

Through the World Organization, needs of the gifted all over the world became visible and recognizable. From the general public came

the concern with elitism, the concern that helping the gifted was undemocratic. Then for a while part of the driving force for gifted education was that the gifted were seen as the greatest resource for a country. This was followed by recognition that it was the civil right of the gifted as it was the civil right of every child to have their educational needs fulfilled. I believe that even though there is still much left to be done, gifted child education is now being recognized as part of the educational scene. To reach this point it was required to look inside, concentrate on achieving these different goals. They were achieved through lively debate, research, articles, conferences, etc.

Now the time has come to open a new area of debate, to begin research in a different direction by adding and emphasizing a different area in conferences and meetings and publications. This area of becoming now concerned with world issues may possibly be the most difficult of all.

One of the well known characteristics of the gifted is their enormous sense of justice. Gifted children are questioners, keen observers, logical thinkers. They will notice inequities, unfairness, double standards, and will question instances and experiences of that sort of thing with passion. Often they feel helpless and powerless to make an impact and they suffer deeply from this fact. They will notice these kinds of problems in family and community and the world in general. They worry about the injustices of the world. They worry about peace, about the bomb, about their future, about the environment, about all the problems that they encounter. But as a rule, we do not help or support them in their quest for coping with these issues.

Debate on ethical questions is actually taboo in many parts of the educational community; or if not taboo, it's being avoided. The educational community keeps itself in splendid isolation. It's afraid of being criticized if it ventures into these areas. It's afraid of being accused of entering politics. So in reality, children are left alone in their struggle with these concerns. In an atmosphere where the environment is open to questions of small and large justice in the world, it is amazing how these concerns are forthcoming from the children at every opportunity. In open discussion groups at our school in Michigan, the first thing that the children would begin to talk about, starting at the age of nine or ten, would be their concern for parents that can't give up smoking when it's known that smoking creates lung cancer, etc., etc.

In most institutions, however, the atmosphere conveys a different type of emphasis. A different type of behavior is seen as acceptable, not the questioning one, but the one that unquestioningly accepts the status quo, the one that sticks to the rules no matter whether they are fair or not fair, the one that does not question whether the rules are fair to women or minorities, etc.

Establishments convey to the children that they are not expected to rock the boat, that they are not expected to question the hierarchy, that they are to be obedient either because that is seen as good behavior or because it is seen as impossible to change by the adults. In this case, often a subculture develops, especially among the gifted. They learn how to beat the system. They learn how to get around the rules. They learn how to impress the adults in the way that they know that the adults want to be impressed. This then makes ethical considerations not emphasized. They will do these things for personal gain. In fact, they learn that might makes right and to think in any other way is being an idealist living in the clouds, not being down to earth. I must make it clear here that, of course, I am not speaking of everybody and every school. But I am speaking of a majority. I am speaking of what I have observed and seen and read and heard from children.

As a rule there is little or no debate on such questions as: Should decisions be made on the basis of personal goals? When does obedience stop being ethical? Is the majority always ethically right? Is team spirit always the final deciding factor? What is loyalty? Is it always ethically right? Does the end justify the means? In what other instances would this be the case? On what basic principles do we base our large and small decisions? In fact, how do we make decisions? Do we give them the information of the small problems in their direct environment and the large problems of the world? Do they have opportunities to look at them from all sides, to think about them? Do we give them the opportunity to take responsibility for them in some way?

Here I would like to stress that I am saying not that we should provide them with answers to these questions, to influence them in terms of our own convictions with dogmatic answers. But the main thing is that these areas should be open to debate and question, that there would be a forum in curriculum, classes, opportunities, emphasis on the importance, as part of their education, to focus on these types of issues. We need to give them the opportunity to think about

what their role in the world would be. What impact could they make and what impact do they want to make? What impact does the world have on their lives? They need the tools to make an impact on their own destiny and the ever expanding inter-relatedness of the destiny of everybody on the planet.

Why is this so important? For a number of reasons. First because we're neglecting an important need within our gifted children and within all children; and secondly because the individual does not grow up in isolation; education does not exist in isolation. We are part of an overall network of relationships and interdependencies. Children need to understand this fact and learn how to live with it both because of their own needs and because of what they as gifted have to offer.

They are growing up in a world beset with problems created by both constructive and destructive technical advances. They will be called upon to make ethical decisions in whatever career they will choose. Whether it is a decision about mercy killing or when a person is legally dead, a decision about abortion, about world hunger, about world peace, decisions about the problems of the environment. These considerations are important for education everywhere in the world and for every child. They are all going to be touched by it in different ways — especially the gifted.

I believe that there is probably a basic set of world problems, world issues, world interdependence which influence each country, each person in a different way; that children in developing countries meet with concerns that children in our nation cannot even imagine. And yet, in all countries it will be gifted people who will make an impact and may be able to bring about change. And it may even be the gifted young people who can learn about each other and be of help to each other.

But in order for this to happen, we must admit to ourselves that our recognizing and supporting giftedness as well as giftedness in itself is not enough. We must admit to ourselves that giftedness is neither a virtue nor a vice, but that the gifted have the enormous potential to be more of each than the average person. They can be the ones who will have the capacity to save this world; and they will also have the capacity to destroy it. We hear about both the valiant efforts and the destructiveness every day in the media and the annals of business politics and crime. When we look at the people involved in the destructive area, we find that those who are the most destructive are

both intellectual or creative giants and ethical morons. They have been given the educational opportunities to consider, to learn the technology, to learn the facts; but they have not been given the same opportunity to consider the ethics.

In this sense we the educators of the gifted bear a great worldwide responsibility. We can participate in educating people who have the intellectual and ethical capacity to understand and unravel the problems of the world. We can also participate in educating people who have the capacity to destroy it because their intellectual capacity is not supported by ethical capacity. I believe we have an enormous responsibility in that we need to focus on this and recognize it, even though it may bring us into certain conflicts, even though it may demand some courage from us.

Before we can try to work with our gifted children in this respect, it seems to me that a precondition is that each and everyone of us who are educators of the gifted, or educators of others, or even human beings must make a decision in terms of our own ethical obligations toward the world. One of the reasons why ethical education does not play a role within the daily program of schools is because it doesn't play a role within the daily lives of us as adults, because we are so concerned with living that we often do not think about how to live. It is for these reasons that I am hoping that we can find ways to focus on ethical and world issues and to give all students a large space in future meetings, in research and debate, in the classroom, and that we do the same ourselves in our own lives.

Students Questioning Students (SQS) A Technique to Invite Students' Involvement

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Overview of Conference Presentation

1. What is SQS all about?
2. An algebra problem and possible questions a student might ask his/her peers about it
3. Types of questions asked
4. Advantages of SQS to students and to teachers
5. Creating an environment conducive to learning
6. Implementation of SQS
7. and then your questions all in 30 minutes

Let us look at the equation $x + 2 = 5$. Will you please jot down or think about questions a student might ask about the solution of the equation, if he/she were presenting it to the class? What questions do you think a student might ask? The essence of SQS is: students question their peers about the problems they are presenting, instead of merely explaining the problems one after the other.

The question is: how can SQS be used to teach talented students the required content in a manner that develops critical thinking skills, allows for imagination, and improves student self-concept, while bringing about healthy social relationships? When you leave this session, you will be able to answer that important question.

A fundamental principle in education is that students learn best when they actively participate in the learning process, that is, when they are part of the action in the classroom. Students are part of the action indeed when they question their friends, they become more attentive listeners to the lesson. Students are encouraged to listen as though their best friends were speaking.

In 1981, it was reported in a *New York Times* article that psychologists Jean Piaget and Jerome Bruner stated that discovery teaching should help children to discover what is in their own minds rather than, to quote Dr. Bruner, "what is out there." To achieve this, students must learn to think. And with SQS, they formulate concepts in their minds, see relationships of information, and verbalize their thinking.

Philosophy of SQS

Mortimer Adler, in his book, *The Paideia Proposal*, (Macmillan Publishing Co., New York, 1982) states: "All genuine learning is active, not passive. It involves the use of the mind, not just the memory. It is a process of discovery, in which the student is the main agent, not the teacher." This philosophy underlies the philosophy of SQS. The teacher is the catalyst in large and small group discussions.

Questioning

In questioning, students must try to relate different aspects of a topic in order to ask intelligent questions. Each question a student asks has a level of difficulty. Gifted students ask more original questions, some not even thought of by the teacher during the lesson. For example, the trigonometric identity, $\sin 2x = 2\sin x \cos x$, was presented to the class by a student. He asked his peers the question, "Why can't we divide both sides of the equation by 2?" Although I have taught trigonometry more than 15 years, I have never posed that question to my students: Additionally, the questioner might stump the class at first; the class is, therefore, further challenged. Sometimes the questioner gives a hint. Sometimes the questioner rewords the question, thus clarifying his/her knowledge and that of the class.

Now I would like to ask you a question. Which number is neither positive nor negative? Of course, the number is "zero." Did anyone not hear the question? There are numerous questions having the answer "zero." For example, a question might be: What number

may not be used as a divisor? You can think of others. You see, if a student does not hear the question and hears the answer only, he/she learns nothing. But if the student answers the question in a complete sentence and uses the key words of the question, he/she brings about continuity of thought and the student not hearing the question learns something.

Types of Questions Asked

What types of questions do students ask in their various classes? The students use adverbs such as: why, what, where, when, how.

During the school year, I model questions using such verbs as: discuss, demonstrate, show, summarize, agree or disagree, suppose it were. The students gradually demonstrate high-level thinking skills in originating thought-provoking questions by using this "vocabulary." the questioner can exhibit inventiveness and a high degree of originality in the formation of questions. the questioner and the class are stimulated to think critically and analyze subject material logically. Their minds are highly challenged. "Recent studies have found that the predominant use of higher-level questions during instruction has a positive affect on student achievement. Questions help students understand content. Students who use questioning also learn more subject matter than students who do not" (Walsh, D.: "Socrates in the Classroom: Strategies for enhancing Critical Thinking," *American Educator*, Summer 1985).

SQS enhances the learning process since the questioner must be able to determine if the student response is correct. The questioner must know well the aspect of the topic he/she is questioning. While an incorrect response is being given other students listen attentively, and the questioner calls on another student to rectify the error. It might be necessary for still other students to pitch in to bring about a correction. Lively discussions of quality can develop. Thus there is a student-student-student interaction which is the foundation of SQS.

Formulation of Questions

The students are encouraged to originate questions about their homework problems as they do them and to write them down. Nevertheless, the questioning is casual and sometimes the grammatical errors are quite creative. Sometimes the questioner makes a mistake, which can openly be pointed out in form of the class. I strive to make

my classroom a stress-free, cooperative learning environment where questions and answers can be risked and where there is no need for embarrassment.

Benefits of SQS to Students

1. Not only do the students gain confidence in participating in the "action of learning," but also confidence in talking with their peers.

2. A social attitude is created among the students. The students introduce the next speaker by name. This procedure helps students become acquainted with each other.

3. A student reported: "Since the class is a friendly environment, the student feels safe, alert and willing."

4. Still another student: "There is not only personal accomplishment in having a successful student-student exchange, but there is also group effort to want to learn and understand together."

5. The students learn how to correct each other's mistakes diplomatically.

6. An on-task, social, educational atmosphere is created.

Benefits of SQS to the Teacher

SQS provides positive feedback to the teacher of the students' understanding of the subject. Importantly, the teacher learns from the students. To quote Anna in *Anna and the King of Siam*: "If you are a teacher, by your pupils you will be taught." I imbue my students with the idea that each one is a teacher and that I am a student too.

Creating an Environment Conducive to Learning

It is important to create a comfortable classroom climate to bring about an easy and successful implementation of SQS. At the beginning of the school year, I decorate my room attractively and regularly have a bouquet of flowers on my desk. I discuss mathephobia (fear of doing mathematics) with my students and have them write a math autobiography, which explains their like or dislike of the subject and any fears they may have when confronted with mathematics.

Dr. Sidney Simon of Boston University, Boston, MA., USA, introduced me to the term "IALAC." (I am lovable and capable.) Students are imbued with the idea that they are all lovable and capable

and that they must believe in themselves. I ask the students what it means "to realize one's potential." Immediately, I start to imbue the students with Norman Vincent Peale's statement, "You can if you think you can." We discuss a commitment to excellence. Throughout the year, I demonstrate my positive expectation of my students. We discuss responsibility, integrity and initiative. Also respect for each other. I explain that I show the same respect and courtesy to the lady who cleans the brass in our school as to our principal.

Early in the school year, we discuss active listening. For example, students are required to face the speaker and be ready to explain in their own words what they have just heard. It is rewarding to observe how students quickly catch each others' errors because they have actively listened.

In addition, I introduce the concept of "creative tension" (credit to Jane Martin, director, Staff Development, St. Louis, Mo., USA), by stressing the importance of each student being highly motivated to learn. We discuss ways in which students can be involved. Students are encouraged to be enthusiastic, on their toes, and ready to share their ideas.

The above approach, which takes 4 or 5 class periods of 40 minutes each, sets the stage for SQS.

SQS is introduced during the first homework review in September. I would say to the class, "We are all avid readers. We can read what is written on the blackboard. I would like you, Ken, (who put the problem on the blackboard), to ask questions of your classmates about your problem, instead of reading and explaining the problem yourself." Further instruction in the formulation of questions an in the implementation of SQS would be give the following days.

Implementation of SQS

Perhaps it is easiest to initiate SQS at the beginning of the school year. Let me add that, although this conference focuses on the gifted and talented, I feel that SQS can absolutely be used to great advantage with all students at all levels.

Suppose I were teaching the commutative axiom of multiplication.

Given: 2 x 4 = 4 x 2, I would first ask the students the question, "What do we call the numbers multiplied together in a multiplication example?" Hopefully a student would answer in a complete sen-

tence, "The numbers multiplied together in a multiplication example are called factors." I would explain the purpose of answering a question in a complete sentence and using the key words of the question. That student would call on another to repeat the answer to see if he/she is actively listening. Students would be encouraged to ask a second question about the factors in the equation. The question could be: "What changes when we apply the commutative axiom of multiplication?" The student offering that question would call on another student for the answer. I would again stress complete sentences. The student responding would answer, "When we apply the commutative axiom of multiplication, the order of the factors changes."

"Suppose it were" questions are popular with the students. I would suggest that we ask a "suppose it were" question about our equation. An alert student would ask, "What axiom are we applying if the equation were $2 \times 4 = 2 \times 4$?" He/she would call on a student for the answer. (This question with the answer given would reinforce material taught the preceding day.) A student would answer: "if the equation were $2 \times 4 = 2 \times 4$, we would be applying the reflexive axiom of equality." Students are encouraged to call on non-volunteers, so that all the students are involved in the "action of learning."

As the year progresses, instruction in asking questions is not always necessary. Students listen attentively to my questions and to those of their peers and seem to proceed naturally to originate their own questions. I feel that children are naturally curious and will ask questions. And it is questioning that I believe is the heart of teaching!

Concluding Remarks

I can only see positive aspects of the use of SQS. My students report to me without exception that my class has more student involvement than any mathematics class they have ever experienced. A statement from the first edition of William W. Purkey's book, *Inventing School Success: A Self-Concept Approach to Teaching and Learning* (Wadsworth Publishing Co., Belmont, California, USA, 1978) sums up the intrinsic value of the use of SQS. The statement follows: When students are invited to assert themselves in socially acceptable ways in the classroom, their feelings about themselves and their abilities are likely to improve along with their academic performance.

Former students Kimmi and Einar (1983) had the following to say about SQS in their evaluations of their courses with me:

Kimmi: I feel that SQS is a method that should be used in every classroom across the nation . . . (First Kimmi wrote ''in every classroom in the world,'' but she crossed the phrase out, evidently becoming more conservative, on second thought!)

Einar: SQS should be used in every subject to promote greater academic results . . .

I have not as yet had the opportunity to test scientifically whether SQS

1. stimulates student thinking
2. enhances the rate of learning
3. affects the quality of discussion and, in addition, provides personal and social benefits for students. I do hope to test SQS during the new school year.

Lastly, I should like to quote from Albert Einstein: ''The important thing is not to stop questioning.''

Thank you very much for giving me the opportunity to share SQS with you.

Challenging the Unchallenged:
Gifted or Not

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I am reporting an experiment in which I became the teacher of 36 14-year-olds in a 9th grade U.S. History class two months into the school year. Many of the students did not like school and had done poorly. A handout previously prepared was distributed to the students the first day that I was their teacher. They began to look through it. First, they were to put down their name; second, the grade they hoped to receive; third, what they would like to learn. At this point they were to turn to page 2 and look at the list of topics. There were 60. Fourth, they were to make a plan of how to learn what they had chosen to learn. On page 3 were sample plans. Fifth, they were to decide how the grade for their study would be decided. Page 4 had some examples: oral or written reports; reports to myself or the class as a whole. There now arose some questions and discussion. It was pointed out that the history class would consist of each of them doing what they had planned. I, of course, would be helping them at every step. Yes, they could work with other students on a topic. What if one of the 60 topics didn't interest them? Then we would add to the list. What would they like to add? What did they have in mind? Yes, they could go to the library. No, a topic didn't

have to be a standard history topic. A few students could not decide on a topic the first day. They were to think about it that night.

The next day a film had been scheduled by the regular teacher. He asked if I wanted to use it. I said, "Yes." It was a portrayal of the United States Constitutional Convention. The next day as class began, I told the students I wanted to show them the first few minutes of the film. I'd then stop it and see how many would like to see the rest of the film. This was done and when I asked by a show of hands how many wanted to see the rest of the film, only one hand went up. I then pushed the projector over into a small side room, had the girl who had raised her hand accompany me, and turned it back on with a wall serving as a screen.

The method was to have each student begin a study of history at a point of high interest and then to have enough flexibility in how they could go about it to allow for a variety of approaches. Any student can be a gifted student if the curriculum and instruction is organized in response to each student's needs and interest. Gifted students generally have a very responsive and stimulating home environment which puts them ahead of their peers academically, intellectually and socially. The "ungifted" need a similar opportunity.

> An educational revolution is upon us. One of the most important events of this peaceful but profound revolution is our dawning discovery that the child is born comprehensively competent and coordinate, capable of treating with large quantities of data and families of variables right from the start.
>
> Every well-born child is originally geniused, but is swiftly de-geniused by unwitting humans and/or physically unfavorable environmental factors. "Bright" children are those less traumatized. (*R. Buchminster Fuller on Education*, University of Massachusetts Press, Amherst, 1979 p. 86.)

After there has been some successful individual study, there can be some reporting of the study back to other students, thus increasing the learning of all.

After the girl finished watching the film, I met with her briefly and asked her what she liked about the film. She said "The *clothes* they were wearing!" Her dream was to one day be a fashion designer. I asked her about studying the history of American fashions. How did that sound to her? Also, what about dress styles and dress codes?

Should there be such, and in the school she was attending? Should an individual have the right to wear what they want or don't want? What about nudists? Should people be able to go about nude if they wished? She agreed to take up the topic of clothing in history, U.S. History, and to consider some of the questions posed.

A group of eight boys who had been most unwilling to learn history and were constant discipline problems turned out to all be friends and were all, together, into the making of model airplanes, it mostly amounted to putting together kits that they purchased. They had not liked any of the 60 topics, but became very excited when the topic of the history of aircraft was suggested. They could also bring their models and work on them at school. In fact, we would set aside a small 10' X 12' room for them. The eight boys were soon coming to class as early as possible and leaving as late as possible.

Again, the idea was to begin with anything a student would find intrinsically motivating; make it as close as possible to the intended curriculum; and have them develop "scholarly" skills with those skills becoming more sophisticated as time went on. Then, from time to time, have more and more of the students report and share with the other students what they were learning.

For example. A few days after the model airplane boys had set to work I asked them if they'd be willing to take some time in the future and tell me why they were interested in airplanes and what was so interesting about them. They said "Sure," if I wanted to invited the regular teacher?" the boys said. About half of the other students said they would like to be present. When the day came the eight students had huge planes all over the classroom from the ceiling prior to class. At the front of the room they had placed additional planes completely covering a long table. Half the class, the other teacher, a student teacher and myself gathered in front of the table. The 8 boys were seated in a row behind the table.

After we were assembled, the students looked at me for direction. I told them to just proceed in any way and in any order they wished. After a little hesitation, one of them picked up a box that a model had come in and read what was written on the side of the box. The plane was a German Messerschmitt. After a moment of silence the boy picked up another box and read what was on its side. It was a British Spitfire. What the boys read had pointed out that the planes were W.W. II fighter planes, and that the German plane was better than the British plane. At this point I raised my hand and said, "Is

that really true? The Messerschmitt was a better plane than the Spitfire? if that was so, then why did Germany lose the war?'' These boys looked at each other, smiled and then one of them began to tell us why Germany lost the war. I was startled with what I was hearing. What I was hearing I had not learned until I was an upper division student at the university. I turned and looked at the regular teacher. His face had a look of disbelief on it. It was hard for him to reconcile what he was hearing with these boys' earlier disinterest in history. I said to the boys, ''Where did you learn this?'' One boy reached behind him, picked up a book, held it up for us to see and said, ''From this.'' The book was, *Airbattles of World War II.* I said, ''Where did you get that book?'' He said, ''From the university.'' The junior high library had little information on aircraft. A friend who was a university student had gotten the book for them plus two others which the boy reached back, picked up and showed us. These boys were getting together at one another's homes after school and working on the models. Since they could do this as their history study topic they had also gotten books to learn more about the history of aircraft. At the various homes one would read from a book out loud while the others worked on the models.

The foregoing is not foreign to how people truly learn. If the schools will create appropriate environments, it will be possible for not only the gifted and talented, but all children to realize more fully their potential.

> ''The Power of their (prodigious) talent is awesome; yet it should be a reminder that proclivities are realized as talent only through the arrangement of conditions that identify, engage, sustain, and fuel its development.'' (David Henry Feldman, *Nature's Gambit*, 1986, p. XI)

The Problems of Gifted Children: Some Solutions for Parents and Educators

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As gifted children are not a separate species, but are in fact children with gifted characteristics, they are prone to the same problems and difficulties encountered while maturing as are all children. However, giftedness can result in problems which are unique to gifted children, and which therefore require special solutions. The purposes of this paper is to outline some of these problems, and to provide some practical suggestions for parents and educators which can help prevent them or, if necessary to solve them.

Problems of Gifted Children

Terman's monumental studies of gifted personality traits (Terman, 1951) strongly indicated that gifted children experience fewer emotional problems than do the non-gifted. While there is still some controversy over these results, several personality traits unique to the gifted have been identified by recent researchers which should result in the impairment of the gifted child's emotional stability or of the child's educational attainment. Thus, even if Terman's results indicate that most gifted children are emotionally more stable, there are personality factors inherent to gifted children that can create emotional problems under certain circumstances.

Along with personality traits which can result in difficulties for gifted children, there are also educational problems that are unique to this group, such as boredom resulting from unchallenging curricula and underachievement.

Prevention of Emotional and Academic Problems

There are several factors involved in preventing the development of problems in gifted children. One of these is the early identification of giftedness in the child. The earlier the nature of the gifts are recognized, the sooner the parent or educator can gather information on the characteristics to be expected with this type of child. Knowledge of characteristics will prevent misunderstandings and conflicts which can result from a lack of information. Many books are now available for both parents and educators (Gogel, 1984) which help in the identification and understanding of gifted and talented children.

A second important factor in the prevention of problems is the development of an effective communication system between adults and their gifted children. The children quickly learn that they are different from their peers in many ways, and will need to check these differences out with adults. If they cannot communicate with adults near to them they will begin to consider themselves to be "weird" or "different", and again their self-esteem will suffer. One method of enhancing communication is by avoiding "killer statements" (Webb, Meckstroth and Tolan, 1982) such as "If you're so smart why can't you remember to take out the garbage". These statements tend to demean the child's gifts and to cut off communication with the adult. Supporting and participating in the child's interests is another key method of maintaining an effective communication system. If the gifted child develops a strong interest in computers, for example, then it is vital that the parent have at least a rudimentary knowledge so that the topic can be discussed. Listening and attending skills become extremely important as well as it is often impossible to keep up with the knowledge of the gifted child in all areas. As peers will often refuse to listen to a gifted child expound at length on a complex topic, it is vital that parents and teachers learn to do so.

The use of humor with gifted children is also an effective method of preventing problems. Learning to make humorous comments about the gifted child's idosyncrasies, rather than getting angry about them usually helps to build rapport and avoids an argument. A comment such as "Could you perhaps beam yourself back from

whatever planet you are now exploring long enough to make your bed?'' will be much more effective than berating the child for repeated forgetfulness. As gifted children often have well developed senses of humor, this approach will help greatly in establishing rapport and thus preventing conflict.

A further method of preventing the development of emotional problems in the gifted involves the implementation of an effective system of discipline. the gifted have the same needs for discipline as have all children, and should not be treated as being different or ''special''. They require a clear set of rules to follow and consequences for breaking them in order to feel secure and loved. The only difference in discipline for gifted children is that explanations of reasons for rules will be necessary more often due to their intellectual curiosity. While they may be more mature intellectually, this should not be interpreted as indicating that gifted children are equally as mature emotionally. If problems appear to be developing in the relationship, due to rebellion or withdrawal, it is often a good technique to have the gifted child write out their list of grievances, as most children are often reluctant to directly discuss such matters with their parents. The parent can then read the list and discuss the problems when the time seems appropriate. The superior mental ability of the gifted chid, combined with their lack of experience in life, can often cause them to create serious problems where only minor ones exist. This technique will serve to clear the air and relieve the pressure on the child.

Emotional problems can also develop from difficulties encountered in the classroom. Ostracism by age-mates, an unstimulating curriculum, or unrealistic expectations by parents or teachers, can create unbearable tension in gifted children, which can then interfere with their ability to learn. Parents must be aware of the potential for these problems to develop, and must therefore carefully follow their child's educational progress. While most teachers are caring and well-trained, they are responsible for the education of the large numbers of children in their classrooms and can therefore miss the development of problems. This is especially true for the very quiet child. Thus, it is particularly important for the parents of gifted children to monitor their child's educational progress as a greater potential exists for the development of educational and emotional problems in this group. Gogel, McCumsey, and Hewett (1985) have

shown that parental persistence is the key factor in working success-fully with schools to facilitate learning in their gifted progeny.

Remediation of Problems in Gifted Children

Once problems are recognized it is imperative that steps be taken immediately in order that the gifted child's potential be fully realized. In severe cases of emotional problems, as is often found in older children whose difficulties have gone unrecognized or untreated for a number of years, counseling is indicated. It is the author's experience that the most effective counseling techniques for gifted children are either Rational Emotive Therapy (Ellis, 1962) to help change the child's faulty belief system, or Cognitive Behavior Therapy (Meichenbaum, 1977) to change the internal dialogue which is caus-ing the problems. For example, the perfectionistic child sets stan-dards that are so high that, even with the gifts possessed, these stan-dards that are so high that, even with the gifts possessed, these standards cannot be reached, resulting in feelings of worthlessness and negative self-talk. The counselor must help the child to see that the goals are coming from within, so that they can be modified to a more realistic level.

Bibliotherapy (Frasier and McCannon, 1981) can be very useful for younger children who do not understand what it means to be gifted, or who run into problems associated with their giftedness. These children usually realize that they are different but sometimes construe this to be a negative quality. Obtaining such books as ''The Gifted Kids Survival Guide'' (Galbraith, 1983), or books specifically on the problem topic, and then discussing them with the child once they have been read, will often alleviate the worries, and prevent the development of more serious problems.

If there are several children within a school who are experiencing problems that result form giftedness, it is often useful to use group counseling techniques. Such groups not only provide a forum where common problems and their solutions can be discussed, but they are also highly effective in providing true peers for gifted students.

It is the experience of the author that, as Terman found, more gifted children mature to healthy, stable successful adults. However, when problems do develop, the superior analytical skills of the gifted child combined with the relative lack of emotional maturity found in

all children can result in problems more severe than might develop in a less gifted child. It is critically important then for parents and educators of the gifted or suspected gifted to gather as much information as possible and to carefully monitor the emotional and educational development of these children if they are to reach their potential and make the contributions to society of which they are capable.

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Advice From a Caterpillar: Ameliorating Diminished Self-Concept Among Newly Placed Gifted Students Through Systematic Teaching About Abilities

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Who are You? said the Caterpillar. This was not an encouraging opening for a conversation. Alice replied rather shyly, "I-I hardly know, Sir, just at present- at least I know who I was when I got up this morning, but I think I must have been changed several times since then (Carroll, in Gardner, 1960, p. 67).

Many researchers have concluded that self-concept plays an important role in developing and manifesting exceptional potential (Barron, 1963; Helson, 1971; Mackinnon, 1965; Terman, 1954). However, research findings among school-aged gifted samples are equivocal.

The bulk of recent studies suggest that a majority of high intellect children show similar self-concept and/or self-esteem when compared to their average intellect peers (Lehman & Erdwins, 1981; Tidwell, 1980). Janos, Fung and Robinson (1985) have pointed out that the literature is not consistent, and that high intellect children sometimes compare unfavorably with average children. Enhanced self-esteem has been observed in gifted children enrolled in special programs (Karnes & Wherry, 1981; Kollof & Feldhusen, 1984; Maddux, Scheiber & Bass, 1982). In contrast, several researchers have re-

ported diminished self-concept or self-esteem among program partic-
ipants (Coleman & Fults, 1982, 1985; Rogers, 1979).

More recently, researchers have focused on self-perceptions of
the gifted label. Janos, Fung and Robinson (1985) targeted highly in-
tellectually gifted children who reported feeling "different," and
found that they were more likely to manifest lower self-concept
scores. The writers concluded that these children needed help in gain-
ing a balanced view of their own self-worth.

In the above studies, one message is clear: identification and
placement in special education programs impacts gifted students.
However, findings are somewhat contradictory, and merely descrip-
tive. None has attempted to reverse negative self-concept changes
through systematic treatment.

Several popular gifted child education programming models ad-
vocate helping bright students understand their abilities (Betts, 1986;
Feldhusen & Robinson, 1986; Tannenbaum, 1986) or supportive
counseling services (Clifford, Runions & Smyth, 1986; Renzulli &
Reis, 1986).

These models are largely conceptual, however, and do not include
empirical data to support the impact of the affective programming
dimension on students' self-concept. Given the possible negative im-
pact of special programming on students at any level, a systematic
approach might have significant import.

Methodology

Several studies were undertaken to develop and field test
materials designed to teach students about the meaning of giftedness.
In particular, the writers noticed that none of the studies reviewed ex-
plored their data for potential interactions among self-concept, grade
in school and number of years of membership in a program for gifted
students, although research confirmed that monitored students' self-
concept dropped upon initial program placement, and rose over
time, particularly when services were discontinued (Coleman & Fults,
1985; Rogers, 1979). We hypothesized that there might be an interac-
tion among these variables. We speculated also that there might be a
"u" shaped relationship between self-concept scores and duration of
program membership, and possibly a suppressor effect for program
membership and grade in school.

Sample. Thirteen school districts, representing ten states, com-
pleted this phase of the research project. Participants in the study

consisted of 215 gifted students (103 boys and 112 girls) in grades two through eight, although the majority were fourth through sixth graders. Duration of program membership ranged from zero (students in their first year) to six: half of the sample were in their first or second year. Because all students were participants in part-time programs, the individual rather than the class was considered the unit of analysis.

Treatment. The experimental treatment, delivered by teachers trained in gifted/talented child education, consisted of a nine topic unit of study about giftedness. Its three phase model was: *knowledge*, to teach students systematically about their abilities; *self-awareness*, to apply information about abilities to one's life and experiences; and *empowerment*, to help students to act effectively (and in accordance with insights generated in phases one and two) in future social and academic situations. It was based, also, on Bruner's (1969) four principles for enhancing affective development: stimulation, playfulness, identification and freedom from excessive drive. Session topics and preliminary field test results have been described elsewhere in detail (Culross & Jenkins-Friedman, in press, Jenkins-Freidman & Anderson, 1985).

Instrumentation. The eighty-item Piers-Harris Children's Self-Concept Scale (The Way I Feel About Myself) was employed to assess self-perceptions. It yields a global profile which can be broken down into six clusters: Behavior, Intellectual and School Status, Physical Attributes, Anxiety, Popularity, and Happiness and Satisfaction (Piers & Harris, 1969).

Data Collection and Analysis

Self-concept and attitudinal data were collected prior to and upon completion of the treatment. Pretest and posttest scores on the Piers-Harris were used in a regression analysis comparing the relative effects of several variables of interest hypothesized to be related to differences in self-concept. The predictor variables were: (1) grade in school (GRADE); (2) gender (SEX); (3) number of years of enrollment in a gifted education program (YEARS); and (4) interactions among the above variables.

Seven analyses were conducted. In the first, the posttest total score was used as the criterion variable, with subsequent analyses employing each of the six cluster scores as the criterion. Thus, the particular posttest score was predicted from the parallel pretest score in com-

bination with the main and interaction effects for SEX, GRADE and YEARS.

Instead of formulating the question as one of observed differences over time, this model made it possible to control for the relationship of the pretest to the posttest. It also allowed us to determine the additional contributions of the three independent variables, singly and in combination.

Results and Discussion

Results of the regression analyses fell into a pattern not previously found by other researchers. As expected, the pretest scores accounted for a large proportion of the variance in posttest scores. However, significant increments to the explained variance were added by interactions of other variables. For example, the SEX x YEARS interaction was a significant predictor of global self-concept ($F1,199 = 10.62$). It was also a significant predictor of the following cluster scores: Intellectual and School Status ($F1,199 = 12.83$), Physical Appearance and Attributes ($F1,199 = 6.02$), Anxiety ($F1,199 = 14.33$) and Happiness and Satisfaction ($F1,199 = 26.91$). In Table 1, a summary of the variance explained by particular predictors is listed, including the increments added by the SEX x YEARS interaction.

TABLE 1: PREDICTION OF GLOBAL AND CLUSTER PIERS-HARRIS SELF-CONCEPT SCORES VARIABLE

Variable	Variance Explained and F-ratio:	Full Model	Increment Added and F-ratio:	SEX x YEARS
Total Self Concept	47%	25.19*	2.5%	10.62*
Cluster 1 (a)	25%	9.69*	(b)	
Cluster 2	47%	24.80*	2.9%	12.28*
Cluster 3	47%	25.27*	1.4%	6.02*
Cluster 4	44%	22.57*	3.2%	14.33*
Cluster 5	55%	35.54*	(c)	
Clsuter 6	36%	12.18*	4.0%	26.91*

(a) 1: Behavior; 2: Intellectual and School Status; 3: Physical Attributes; 4: Anxiety; 5: Popularity; 6: Happiness and Satisfaction
(b) YEARS added a significant but very small increment ($F1,202 = 3.93$, .5%).
(c) No significant main effects or interactions. Solutions of the prediction equation revealed that for girls (code = 1), self-concept scores increased with the number of years of program participation. In contrast, boys' scores, although initially high, decreased slightly over time.

Further examination of the YEARS x SEX interaction revealed that both sexes evidenced an initial self-concept drop in the first two years following placement. Girls' self-concept then rose significantly, dropped slightly in the fourth year, then rose again. In contrast, boys' scores remained relatively stable after an initial (slight) drop, then plunged an average of seven points in the fourth year before rising again. However, these results should be qualified: for both groups, there were only a few students who had participated in programs for more than four years. Other factors, such as test-wiseness or social desirability, could have inflated their scores.

Conclusions

The writers do not believe that program participation had a negative impact on boys. It might be that boys had an unrealistically inflated self-concept prior to being identified for gifted education programming. A possible scenario is that over time these boys (who were exposed to the experimental treatment) became more realistic in their self-perceptions.

The changes among the girls were also interesting, particularly the reversal of the downward trend of their self-concept scores. Given the propensity for girls to drop out of gifted education programs in the higher grades, these data hint at avenues for reducing those trends. The quadratic effect for program membership, while restricted due to a limited sample size, should be investigated further.

Of course, this model does not permit attributing self-concept changes to the experimental treatment. However, the possibilities are intriguing. Furthermore, it might be possible to use these data to support the importance of special programming, given the literature cited earlier relative to the positive link between self-concept and later life achievement.

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Creativity as Mysticisms: A Destructive Barrier to Effective Education

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A Choice Between Competing Definitions

There is substantial evidence that modern education and other segments of the society stifle individual development by communicating a narrow, restricted and mystical view of creativity. By mystical, I mean obscure, baffling, mysterious, inexplicable and incomprehensible. In spite of significant exceptions by some educators, much of the literature and far too many of our young people conceptualize creativity as a trait limited to a few special, gifted, and talented individuals. I do not believe this is true. We seem to have rejected an older, more broadly defined view of creativity and replaced it with a narrow part of that older definition — the mystical part. The result is less clarity and greater confusion. Researchers announced a decade ago that none of the theoretical accounts of creativity appeared to explain adequately its nature or provide for it to be measured.[1] Our understanding has increased little since then.

The Ancient Meaning of Create

The ancient definition of "creating" is illustrated by the Hebrew word *barah*, as used in Genesis, chapter one, verse one: "In the be-

ginning God *created* (barah) the heavens and the earth'' — commonly meant he organized existing elements for some purpose.[2] Before the 20th century, creating was generally perceived as making; it was ordinary, natural, common, widely practiced, expected, and easily understood. ''Creating'' in this sense was expected of everyone. In fact, in those prespecialization eras, if one did not develop a fairly wide repertoire of creative responses, life quickly became less enjoyable and much more insecure. A loaf of bread, a basket, a tool, a shoe, whatever, was very much an individual creation. These skills were widely dispersed and carefully perpetuated.

Man was considered the offspring of God — created in his image and likeness. He was to become like his Father in heaven.[3] As God created by organizing things out of existing elements for some purpose, so should man. Creativity was an inherent aspect of his very being. The limits may have seemed boundless, but they were not restricted to the mystical. Jesus, the great teacher of Israel, voiced this philosophy in his statement: ''The son can do nothing of himself, but what he seeth the Father do.''[4] Following some pattern toward a predetermined end was acceptable; it was not viewed as noncreative behavior.

This ancient notion of creativity, viewed from man's perspective, did have a mystical dimension to it. Man's ways were not God's ways. He did not understand all that God understood. Abraham, Jacob, and Moses marvelled at the power and wisdom of God. They did not always understand his mighty works; such were a mystery unless God provided explanations. But in their own human stewardship, these patriarchs were very comfortable learning to become like God. Creativity for the ancients was a continuum. Creating consisted of organizing existing elements for some purpose: Planning and harvesting, building and preserving, singing and dancing, adoring and reverencing. Only that which God gave to them without explanation, which they could not comprehend, was mystical.

A New Definition of Creativity

A modern perception of creativity has recently come to dominate both professional education and the arts. The new definition equates *creativity* with *the development of new, novel, strange, different, spontaneous, unusual or even bizarre products and actions.* As J. C. Gowan et al. observed in 1967:

> Creativity is a word which has recently been taken over by science from religion (and) it is almost impossible to discover it in a dictionary or encyclopedia more than a decade old. It is a new concept, recently attributed to the personality of man, and still fraught with some mythical connotations.[5]

This new definition of creativity tends to be elitist and mystical in nature. And for that reason educators should avoid perpetuating this narrow view of creativity. It is restrictive, often debilitating to the individual, and may add confusion and inefficient complexity to the educational enterprise.

Limitations of the New Definition

I became concerned about the definition of creativity several years ago while teaching courses on the subject to prospective teachers. Frequently, I began the first class period by asking students to suggest words they considered to be descriptors or indicators of creativity. Consistently, the reported list was dominated by terms such as *new, unusual, unique, strange, different*, and *novel*. After reaching a tentative agreement on the definition of creativity, I would ask the students to indicate, by an uplifted hand, how many saw themselves as creative individuals. The response was consistent: Only a few (usually 10 to 20 percent) of the twenty-five to thirty-five students would respond in the affirmative. Intimidation was high, confidence low, and self-esteem questionable. Confusion was evident.

In a way, it seems ironic that a secular world would adopt a mystical foundation for one of its most admired phenomenon. Yet the evidence abounds. Some writers freely acknowledge that the "popular stereotype sometimes confuses the creative genius with the emotionally disturbed."[6] Or, as the editors of the *Colorado Symposium* of 1962 argued, "the study of creativity need not limit itself to the eminent, the extraordinary; (nevertheless) if we include 'everyday creativity' in our study, we may be in danger of making our conception of it meaningless."[7]

This type of thinking only perpetuates the mystical stereotype. It seems to prevail in spite of counterthrusts, such as J. P. Guilford's position that creativity can be understood and explained, and similar research findings like those of Calvin Taylor and Paul Torrance. The entanglement of creative activity with the mystical has been solidly retained in the modern definition. Focus on the exceptional has been

so alluring that it has obscured the universal distribution of the ability to create and the diverse expression of creativity in the individual.

Educators, it seems, are better served by the ancient definition which holds that *creativity is simply the act of organizing existing elements for some purpose* — a definition largely ignored and sometimes ridiculed by contemporary society. This older definition, while including the ability to originate the new and different, emphasizes the value of developing skills and products that promote the ordinary, natural, common, widely practiced, expected, and easily understood. It is also a perspective much more friendly to the kind of research we are capable of conducting. And equally important, it is view that properly perceived is simply an extension of the basic curriculum. Accurately envisioned, the structure and function of the general curriculum constitute a vital and exciting approach to fostering creativity as a human resource. It is an approach that complements the focus of the SUNY-Oswego experiment.[8]

Creativity as an Expression of the Curriculum

Recognizing the primary components of the basic school curriculum validated the perspective on creativity proposed in this paper. For more than a century, American educators have been attempting to refine the objectives of public school curriculum. These purposes can now be reduced to four fundamental components, most clearly evident in their practice in the elementary classroom: (1) language and the expressive arts, (2) mathematics, (3) science, and (4) social studies. Each of these components represents a specific type of thinking — a set of glasses, if you will, through which each person perceives different aspects of the world. The assumption is that all our sets of glasses are necessary if a person is to maximize his or her personal understanding, effectiveness, and satisfaction.

The distinction between these respective components can be recognized in the performance patter of most elementary school teachers. For example, it is common practice to divide up the school day into these four areas. A teacher tells her students, "Put away your reading books and get out your math books," or announces, "Now we are going to do science." At secondary levels, although the four segments of the curriculum pie are sub-divided into smaller slices, the objective remains the same: *prepare students to see the world around them by equipping them with these four special in-*

tellectual instruments. If any of the four sets of glasses are missing or defective, then students will be handicapped. Students will be unable to see and understand what otherwise might have sustained and improved their lives.

The Value of Language and the Expressive Arts

Each of the four tools has its own unique characteristics, its own conceptual emphasis, purpose, evaluative criterion and declaration. The mechanism underlying Language and the Arts, for example, equips the individual to make *personal, interpretive judgments.* Properly fitted glasses in this area help individuals evaluate what is satisfying and dissatisfying, beautiful and ugly, according to aesthetic guidelines. It is a subjective approach to uncertaining and communicating feelings. Language and the expressive arts are means to this end. Prose, poetry, art, dance, and music are specific examples of subject matter.

The Value of Mathematics

Mathematics trains a student to use the power of *Logical deductive thought.* This instrument enables the person to validate and invalidate based on principles of internal consistency. With these glasses an individual can qualify and measure. Students learn to control and utilize matter by addressing it in terms of symbolic numbers and conceptual principles. They learn that $3-2 = 1$, and they affirm the internal consistency of their knowledge by demonstrating that $2 + 1 = 3$. Confidence is assured by the balance of the equation and the order that sustains the principles. The capacity to dissect the world with the language of numbers allows man to perceive order in nature and to make greater use of this natural order.

The Value of Science

Study of the subject called science, is a way to develop the student's capacity to use *empirical incitive thought.* The elementary teacher who directs her students to plant a bean in a paper cup of soil and observe the consequences as sunlight and moisture are supplied is fitting these students with another set of glasses. She is teaching them how to confirm or disconfirm guesses about what might happen. She is equipping them with the methodology of prediction based on

manifestations of natural law. She is providing them a tool by which they can access their physical environment through understanding both its discrete and complementary functions.

The Value of Social Studies

The hours spend discussing social studies is the educational optometrist's attempt to fit each student with a fourth set of glasses that will bring into focus another dimension of life. The ability to *recognize and assess norms and values* is the desired goal. Expertise in social science allows people to understand what is normal and not normal, and what different peoples consider desirable and undesirable. It its mature form, this mode of thought is buttressed by the language of statistics, which allows a student to communicate another form of prediction.

The Four Objectives of Teaching

Essentially, all that any teacher ever does can be reduced to fitting students with one or more of these four sets of glasses. These respective modes of learning each reveal a different dimension of life, just as the 35 mm camera, X-ray machine, radar instruments, and sonar devices are each designed to help us capture different dimensions of existence. When one cuts away the huge curricular wardrobe, one can see that these four mechanisms constitute the basic frame of education.

Traditionally, elementary teachers are expected to have some expertise in all four areas. Their task is to help the students (1) find satisfaction through language and the expressive arts by combining skills and acquired aesthetic sensitivity, (2) use the instrument of numbers to validate deductively the application of theorems that have internal consistency, (3) experience the inductive empirical search for confirmation based on predictability, and (4) discover normative action through observation and statistical prediction. Secondary teachers are usually specialists who spend all their time working with only one or two sets of these glasses. When the teacher does not possess these instruments, or when his or her vision is impaired by lenses with flaws and defects, students are likely to suffer. Concepts such as core curriculum and general education, are intended to prevent such difficulties, but they are not always successful.

Creativity and the Four Curriculum Components

The relationship between creativity and the four curriculum components becomes clear as one examines (1) the *subjective evaluative* nature of the mechanisms that underlies language and the expressive arts, (2) the *convergent* nature of logical deductive thought in mathematics, (3) the *divergent* nature of empirical inductive thought in science, and (4) the *objective evaluative* nature of normative/valuative thought in social studies. When viewed from this perspective, the fundamental mechanisms (knowledge structures) underlying the regular school curriculum clearly are nothing more than the *primary elements of creative thought* — convergent, divergent and evaluative thought and action. Organizing existing elements, symbolically or empirically, is the mainstay of proficiency in each of the four segments of the regular curriculum, just as it is in exercising of the very capacities which constitute the substance of creativity.[9]

NOTES

1. William E. Rowerton *Creativity: A Review of Theory and Practice* Wisconsin Research and Development Center, 1970, p. 15.
2. It is recognized that an ongoing debate has existed between scholars who favor the early Greek philosophies that held creation *ex nihilo* — making things out of nothing. However, even those who argue the necessity of the latter position because of certain Christian doctrines, such as the resurrection, acknowledge that anciently the common belief was that existing materials are required in order to create. For example, see Jonathon Goldstein "The Origins of the Doctrine of Creation Ex Nihilo" *Journal of Jewish Studies*, Autumn, vol. 35, no. 1, 1984, who states "Believing Jews and Christians have long been convinced that their religion teaches that God created the world *ex nihilo*, from absolutely nothing. Yet medieval Jewish thinkers still held that the account of creation in Genesis could be interpreted to mean that God created from pre-existing formless matter, and ancient Jewish texts state that he did so." p. 127. In a response to Goldstein's article published in the same journal under the title "Creation Ex Nihilo Revisited: A Reply to Jonathon Goldstein," Spring, vol. 37, no. 1, 1986, David Winston notes that "there is no evidence that the rabbis were especially attached to a doctrine of creation *ex nihilo*. Indeed there is prima facie evidence that such a doctrine was far from being commonly accepted by them." p. 91.
3. Genesis 1:26-27, Matthew 5:48 (KJV)

4. John 5:19. (KJV) cf. F.F. Biehler and J. Snowman *Psychology Applied to Teaching* (4th Ed.) Boston: Houghton Mifflin Co., 1982. This text exhorts teachers to recognize that creative activities are less desirable.'' p. 99

5. J.C. Gowan, G.D. Demos, and E.P. Torrance *Creativity: Its Educational Implications* New York: John Wiley and Sons, 1967. p. 1.

6. J. C. Gowan, p. 2.

7. H. E. Cruber et. al., *Contemporary Approaches to Creative Thinking,* New York: Sutherton Press, 1962, p. x.

8. A report on the experiment at State University of New York (SUNY) to incorporate a type of "structures of knowledge" emphasis related to teacher training and the four components of the curriculum is found in William E. Doll "Preparing for the Post-Industrial Society: Oswego's New Direction in Teacher Education" (a paper presented at the AACTE meeting in Detroit, Michigan, February 23, 1983.

9. Project IMPLODE, *Igniting Creative Potential* (funded under Public Lae 90-247, Elementary and Secondary Education Act of 1965. Grant No. 54-70-155-I ESEA Title III. Copyright 1971, Bella Vista Elementary School, 2131 East 7000 S., Salt Lake City, Utah. Based on the research of Calvin W. Taylor, J. P. Guilford, and E. Paul Torrance, p. 1.

Educational Reforms' Success Depends on Accountability

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On accountability for educational progress, let me attempt to do three things. First, let me make some general comments about educational reform and how the difficult process of implementing reforms is affecting education in our nation. Second, I would like to describe the accountability effort in South Carolina. I will explain why I believe that it works so effectively and what the forces are that make this happen. And third, I would like to share several lessons I have learned that relate to the movement of making learning and teaching better in the United States.

I believe that most states have already enacted into legislation more educational reforms that they can support financially. Given the current state of our economy, *I believe that in coming years the principal efforts in public education will have to be related to what is already enacted into law.* Very few new initiatives will take place unless the economies of many states improve substantially. As an example, those states that have, or are serious about developing, career ladders will probably continue to support them at various levels, but I doubt that any new measures in states that do not already have careers will be enacted into law.

However, new measures will occur in higher education. The new wave of reform is now in higher education rather than in public education. I think that legislators and governors would do well to examine higher education as an area for reform and let the reform effort in the public schools be concentrated on implementing what has already been agreed to by state legislatures and boards of education.

The second general observation I should make is that reform is maintained by a stable coalition of individuals and organizations dedicated to reform. For the most part, during the early Eighties, legislative bodies worked very closely with governors to put together a coalition to support educational reform. That coalition included not only the elected officials of the state and educational leaders, but it also included the private sector. The private sector involvement was very helpful in getting needed financial support. I think all of us recognize that the most powerful influence on legislative matters relating to taxation comes from the business and industrial world. Businesses usually account for half or more of state taxes. Their support and their interest in educational reform is needed. That support coalition in many states is beginning to break up. As a prime example, I would cite California, where the governor and the state superintendent are in open warfare, the coalition has broken up, and people are choosing sides. There are two reasons that support by a coalition breaks up: priorities cannot be established and funds are insufficient to support the entire program. We did this in South Carolina when we found there wasn't enough money for the building program. People began to take sides to support the building program or teacher incentives. That kind of situation causes the coalition to break up. A second reason that coalitions break up has to do with a change in key leadership in the legislature, department of education, or governor's office. For example, when the coalition is held together by a governor and legislators who are committed to that particular effort and a new governor and/or new legislative leaders come in, that offers a possibility for the coalition to break up.

Fortunately, in most sates the previous efforts have been so intense and so widely supported that new governors have had very little choice but to stay on the bandwagon. Certainly not always with the same fervor and with the same commitment to the total reform package as previous governors, but nevertheless, the new governors have not disavowed the school reform effort.

The third general observation is that *results are becoming far*

more important than activities or counting of numbers. People are beginning to say, "We don't really want to know what the methodology is or what you're doing. What we want to know, as they say in the private sector, is the bottom line:"

Are students improving their academic achievement?

Are the dropout rates decreasing?

Is attendance increasing? Are there more students who are succeeding in college?

Reporting data which simply show that 12,000 teachers have been trained or 8,000 individuals have participated in a workshop has very little relevance to the quality of education. People are saying, "We want to know the results." Results are more important than how many students or teachers have participated in a service.

Let me shift to the establishment and early operation of the Division of Public Accountability in South Carolina. I believe very strongly that the Division of Public Accountability in the Department of Education was important in accomplishing several things. When I was interviewed by the governor, by the private sector oversight committee that was created by the Education Improvement Act, and by the state superintendent, they indicated that the Division of Public Accountability was to protect the integrity of the Education Improvement Act; that South Carolina was serious about implementing the reforms. They wanted to be assured that the law was maintained as it was written. As you know, legislation can be watered down or the meaning changed from the intent after the legislature has passed it.

A part of my job was also to beat the drums for quality education and for improving education; to go throughout the state with the message that education was going to improve in South Carolina. That was an important part of the Division's work — to help people capture the vision that had been created by the governor and the task forces.

I was asked to establish a program to validate compliance with the Education Improvement Act so that we could show the legislature that there were individuals who were accountable for each item in the law. We used a "perjury system" to validate that every item in the law was in fact implemented. Persons had to sign off and declare through a process of perjury that they had actually put into operations the requirements of the law.

Once each year I also was to document for the legislature that the benefits were worth the cost. Each year we produced a report indicating the benefits. Throughout the process there were items that would not have been as well done as they were without the intense oversight and without the work of the Division of Public Accountability. Many of these items were never shared publicly, but were internal debates that occurred between the agencies and the Division of Public Accountability. These are very sensitive items and I use some of them only to illustrate the accountability procedure and not to be critical. But I want to share with you what I believe were important measures that came out of the law and were implemented because of the strong position of the Division of Public Accountability.

When I first went to South Carolina in October of 1984, one of my first meetings was with a legislator who mentioned that there was a provision in the law related to affirmative action. Up to that point nothing had been done to implement that provision of the law. I believe that this provision should have been implemented immediately, because most of the employment opportunities occurred in August and September. When I met internally with the department leaders, they did not have a particularly forceful position on that provision of the law. But very soon thereafter, the State Board of Education quickly passed the regulations related to affirmative action and complied with the law as rapidly as possible.

The second difficult item was a provision in the law that provided equity for all children. At first I was told that the computer could not give us this kind of information. But of course, the computer will do whatever you tell it to. Through the Division we designed and developed a program where all data could be reported by quartiles so that we could see how the children in each quartile were doing. And the fact is that the bottom quartile has made the most gains. I do not believe that the data would have been reported by quartiles had it not been for the insistence of the Division that the law required it and that equity could only be shown by reporting the data by quartile.

The third item dealt with the structure of the research. Rather than cross-sectional data, we believe that longitudinal data are essential. The children ought to be tracked from year to year, looking at the same children rather than different children—comparing the second grade children when they get to third grade to see what the gains are. That again became a computer problem that we resolved.

All data now are reported on the basis of longitudinal data, which gives a much better picture of how children are improving.

The item where the Division encountered the greatest reluctance was the provision in the law that encouraged our school districts to build partnerships with the private sector. We had to build a foundation. We had to build adopt-a-school and volunteer programs. The law was very strong in wanting to implement partnerships with the private sector. There was a great reluctance by the educational agencies to get the private sector involved in local school affairs. The belief was that businesses would be interfering, that they didn't know what they were doing, that maybe they ought to be spending their time with criminal justice or some other area. But nevertheless, the law required the implementation of business partnerships. We had a very able individual in the Department of Education who did a masterful job in getting the private sector involved with the school communities and, I think, with beneficial effects.

One of the differences of opinion that arose was whether the Division of Public Accountability should be disbanded after the three-year period. I was told that the Division would be established for three years, after which I would return to Salt Lake City. At the end of the three years it became obvious that the Division should be continued. The Department did not want to continue the Division, but with the help of the governor and legislators the Division was kept for an additional three years. There is a new deputy and the Division still exists. My feeling is that the Division of Public Accountability will be in existence for a long period of time because it serves a useful purpose. *It increases the feeling of confidence that the law is being implemented appropriately and that the benefits are being examined more critically.*

So what are the lessons that I have learned? I have learned that *public confidence is directly related to specific educational improvements.* Public confidence is not related to rhetoric: "We are working harder." "We are putting in more hours." "We are doing things better than we did before." Public confidence is related to specific achievements.

When South Carolina can say that for the first time in the history of the state, children are achieving above national norms on norm-referenced tests, that makes South Carolina citizens feel that the reform effort has accomplished something. When South Carolina can state that its students have made more improvement in the SAT, both verbal and math, in the last four years than those in any other

state in the nation, that is meaningful to people. If we could say that we have increased the ability of our children and young people to go to college and stay in college and finish, that would be meaningful to people.

In 1983, the governor's office took a poll of South Carolina citizens' attitudes toward public education. The question was, "Do you believe that South Carolina has good schools?" Thirty-five percent said yes. That is a rather low public confidence level. But in 1986, given the same question, 55 percent of the people of South Carolina said, "Yes, we have good schools." It is now above 65%.

The Division of Public Accountability conducted many of those polls and also put together the accumulation of the data on the results so that the legislature, the governor, the public, the press would all have specifics about the results we were getting from the expenditures we were making. As an example, one of the most cost-beneficial programs in the South Carolina law was the Early Childhood Education section. With a small expenditure of money, a dramatic increase occurred in the number of children who were ready for kindergarten. It was not a big program, but the cost benefits of that program were enormous. You could essentially look at this program and say, "If you spend this money, you will get these results."

There were other programs that were not as cost-beneficial. For instance, the Staff Development Program, from my point of view, has never produced the benefits that were intended because there is a confusion between staff development and teacher evaluation. State provisions which are viewed as calling for teacher evaluation are in fact staff development. As a result, the staff development practices do not produce the benefits that should be expected given the cost.

The second lesson that I have learned is that *the actions of the governor are absolutely critical.* The governor's office is the centerpiece of any reform action. It takes the governor's astute political and human relations skills to keep the coalition together. In working with the state of whom have different interests—it is extremely important to have someone who can hold that coalition together. When differences arise, the governor can moderate and can do what is necessary to get people to stick with the program. When reform has worked exceedingly well, there is a sense of unity exerted by the governor's office that holds the reform together.

The next lesson that I have learned, and for me it is probably the most important lesson of all, is that the private sector and the business community are friends of education—universally. As superin-

tendent I supported heavy involvement in the Salt Lake City schools by the business community—participating with the Chamber of Commerce, meeting with the Economic Development Board, and doing many things to entice the business community into partnerships with education. I submit to you that this is not a common practice in the nation.

There are many school people who are afraid of the business community, who believe that the business community is out to hurt the public schools. If that feeling exists, it is not the feeling that is in the private sector; it is a feeling that exists in the public sector. I have personally never had any experience with any private sector leaders who are out to get a superintendent or to hurt the public schools. I think they have learned a lesson that good schools are good for business.

When you have education as a high priority you have people who want to live in that area, people who want to start businesses and be active in that community. It is not a matter of political parties. The chief business leaders who have made a difference in education in South Carolina care less about the politics of South Carolina. I am convinced that they want good schools in South Carolina. They supported Governor Riley's efforts to implement the Educational Improvement Act and they will support Governor Campbell's efforts to implement the Act because they believe good schools are good for business.

The final lesson I have learned is oversight is serious business. *Oversight is needed because agencies of the government will not reform themselves voluntarily.* Effective accountability can only exist through third-party intervention. I think that agencies of government have a tendency to serve themselves rather than the clients they were established to serve. It is extremely important that the individual who heads an accountability program have certain kinds of conditions. *Ideally you should have an accountability program headed-up by an individual who doesn't need the job.* If I were dependent on the job, then I might agree to some things that I should not. Also you need support of the private sector and of legislative leaders, so that you don't feel out in left field all the time. I think once the accountability portion of any agency is controlled by that agency the chances for abuse are far greater than if the accountability program is an independent process.

But, when oversight is established, too often people look upon it as a perfunctory activity. *If you are going to have oversight, you have*

to put effort into it and work at it. I realize that legislators have a lot of priorities and a lot of things to do, but oversight demands involvement. You have to read the reports; you have to study the data; you have to become involved and attend the meetings. If you are going to have oversight, it has to have integrity. Legislators have to participate. You have to be able to demand the appropriate reports. And the accountability director should report directly to the legislative oversight committee to ensure a direct line of accountability from the law that was enacted by the legislators.

I believe that today you and I have the power, the authority, the know-how, and all of the pedagogy that we need to have effective schools in all of our states. I don't think we need a lot more research. It is more a matter of will and desire to do so than it is any other condition. Money is important, but money is not the principal basis on which schools are improved. *The principal basis on which schools are improved is a will of the people to do it.* In this country we no longer can have the luxury of undereducating our children. We can no longer permit a third of the student population to achieve below grade level. We cannot afford it economically; we cannot afford it on talent.

If educational reform efforts do not succeed, it probably will be due more to the lack of emphasis on accountability and oversight than anything else. I hope that all of you would consider that as you go about your business to try to establish whatever is appropriate in your particular state. Certainly the South Carolina model can't be duplicated in every state, although it works very effectively in South Carolina.

Each of you must devise some structure that will produce the information that will enable you to say, "We spent a million dollars and we got this result. We spent \$50 million and we got this result." You will need to know this so that you can make intelligent decisions about the allocation of resources at a time when there are other kinds of needs. There are other state priorities, but education will continue to be one of the main items on your agenda. Your involvement in requiring, and supporting, accountability will be a key to how well your state educational reforms really work.

Things I learned as former Deputy Superintendent, South Carolina State Department of Education:

1. Most students (as well as adults) have more talents than are ever identified or utilized.

2. Students who are identified as talented make the most gains after being so identified.
3. There are far more talented people than ever identified as talented.
4. Organizations do not reform themselves voluntarily.
5. Students who are treated as having certain talents develop those talents.
6. Accountability improves the quality of an agency and the performance of the people within the agency.
7. Accountability creates greater opportunities for people to express their talents.

Math, Science, Computer and Other Languages for G/T Programs

The Des/Oxford Research Study of Identification and Provision for the Ablest Math, English, Physics and French Students

11 Oxfordshire Comprehensives 1980-1986

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Context: The history of UK research studies through Bridges, Tempest, Ogilvie, Hitchfield, Pringle, Kerry, Painter, Freeman, Wallace-Adams, Maltby, Leyden and others over the last 10 or more years has been tending away from general high ability studies to specific giftedness ones and from examination of the 2% to a view that we should be studying more like the top 10%.

The Oxford Project: This was funded by DES in two parts. It was the first major DES study in this field apart from the HMI one 1975-77.

The grant holder and overall supervisor was Dr. H. Judge; Principle researchers were Dr. K. Postlethwaite and Dr. C. Denton, Chairman Steering Committee Mr. D.T.T. Marjoram.

Part 1 September 1980: Aimed to identify top 10%, Including gifted .5-1.0%, of 3rd year secondary pupils in each of English, Maths, Physics, French in 11 Oxfordshire compehensives.

Two successive 3rd year groups of pupils (2400 Yr 1 & 1500 Yr 2) were studied.

Main Research Questions:
How effective were teachers at identifying?
How effective were checklists?

What were characteristics of pupils identified by teachers and those missed?

Design: Criterion for assessing ability was performance at '0' level. In each subject teacher-selected top 10% in terms of '0' level potential was compared with top 10% by test.

Data collected on 3rd Yr. pupils in a previous study was combined with their subsequent '0' level results by using multiple regression analysis.

This produced 4 prediction equations (one for each subject) from which '0' level success could be predicted from 3rd Yr. data.

In this study, identical tests were used and from the results '0' level potential was predicted. Precise estimates of possible test errors were calculated.

These assessments were compared with teacher assessment-based lists of top 10% in each subject.

The match between test & teacher lists was studied. Teachers interviewed.

Teachers in half the schools (randomly chosen) were asked to use checklists to guide a second round of identification. Teachers in other schools did a second round of identification without checklists. Second round of identification took place a term later. Results of checklist/non-checklist based identification were compared.

In the second year a replication of the main investigation was carried out.

A more detailed study of maths checklists was made.

A personal construct study was used to find pupil characteristics to which teachers were sensitive.

Research Instruments

Differential Aptitude Test (measure of ability)
NFER Research Test SF7 (measure of attitude)
NFER Research Test SF4 (measure of creativity)

Findings

Prediction Equations: In Eng & French equations, Language usage was a prime element.

In Maths equation — numerical ability
In Physics equation — mechanical reasoning

Subject Specific Nature of Identification

Of all pupils nominated in top 10% in at least one subject:
12% received 4 nominations
45% received 1 nomination
(Figs for test based identification were 15%, 40%)
This would suggest many pupils of high ability in 1 subject would be overlooked by overall measures of ability.

The Top 5%: These turned out to be randomly distributed across all schools.

The Effectiveness of Teacher Identification

% of pupils nominated by teachers also on test-based list

Eng	French	Phys	Math
65	51	45	61

When possible test error was taken into account, agreement %s became:

88	64	70	84

This suggests good teacher/test match in Eng and Math, but teacher error exists in French and Physics.

Subsequent rounds confirmed these figures.

Effectiveness of Checklists

On first round on evidence of effectiveness.
On second round, some improvement in Physics
In maths, classroom observation of checklist use revealed that teachers had problems in spotting characteristics on the list.

Characteristics of Teacher/Identified Pupils

Language usage in Eng; general ability in Phys (greater accuracy of E/ts)
Sex (bias towards girls in 5 schools) in French.
Eng/Math teachers sensitive to subject specific skill. Fr/Phys teachers more sensitive to attitude.
Favorable attitude scores correlated with teacher selecting esp in F&P Part 2 Jan 83—Sept 86.

Main Research Question:
What is the effect of classroom-based enrichment?

Design

8 Comprehensives (2 single-sex) took part:

5 produced control and target groups in consecutive years (no enrichment in first year, enrichment in second year)

3 piloted enrichment materials for the first year.

59 classes and teachers involved.

Research groups selected from 3rd year pupils (13⅓).

Subjects studied were Math, Eng, Physics.

Identification

Teachers of these subjects nominated top 20% in 3rd year classes.

These were given a battery of APU subject specific tests, attitude and interest tests. They were observed systematically by staff and researchers. Top 10% in each subject were then selected.

Same tests were used again for the 2nd cohort.

Research Instruments

Ability tests were designed to produce a subject specific, process oriented profile for each pupil together with attitude/interest scores.

In addition, interviews with teachers and pupils took place; pupils kept diaries; work sampling techniques were used.

Enrichment Materials

All existing materials were examined.

In the end, materials used according to:

a) being related to core curriculum of each subject

b) incorporation of challenges across the range of process variables

c) challenges at the higher level of Bloom's taxonomy

d) contained problem solving elements

In English a large selection of topics/pamphlets was made available

In Maths a large number of projects, harder problems etc. available in

In Physics-centered more on club/home activity

Subject specific features in each subject were examined:

Maths   Handling information, strategies, generalizing, proving

Eng Organization, style, grammar conventions, orthographic conventions, Attitude to self motivated writing, reading choice/enthusiasm/width

Phys Using symbols, using apparatus, measuring, observing, interpreting data designing and performing investigations.

Findings

Maths Improvements in strategies, methods of solution, generalizing.

English Self motivated writing improved; range of reading increased; more enthusiasm for reading.

Physics General improvement in categories of experimental design.

Attitudes Heightened interest. No detectable carry over to hobbies or career aspirations.

Most able No detectable differences of effect between top 10% and top 1%.

Teachers Welcomed the materials. Found difficulty over administration and finding time. Thought INSET essential. Felt enrichment needed to start sooner. Preferred short problems to long-term projects. Felt 1 year's enrichment insufficient exposure to produce really measurable effects.

Pupils Felt they should not have had to do normal homework plus enrichment. They felt overloaded.

Overall Need for coherent school policies. Need for clear agreement on 'enrichment'.

International Research Conference at Lady Margaret Hal Oxford with Minister of Education

For a week the Oxford and comparable research worldwide was presented and discussed. 100 observers and delegates came from LEAs, Universities, Colleges and schools including distinguished visitors from USA, Israel, West Germany, South Africa.

The conclusions of this conference were as follows:

1. Need for Coordinating Agency or Centre in UK.

2. Need for further research to inform INSET, IT, methodology and school management.

3. Need for follow-up studies of different types of enrichment.

4. Need for study of most effective parental and community support.

5. Need for national guidance and leadership on Curriculum Differentiation.

6. Need to follow-up some of the existing pupil groups.

7. Study of enrichment in eg French and CDT

8. Study of focused enrichment on a group of 9-11 year olds.

Stewardship, Serendipity and Computer Science

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A Second Course in Scientific Problem Solving Using FORTRAN is taught at Brigham Young University for science and engineering students. Students design their course using a personal stewardship plan. The structure and format of the course is supportive to gifted and talented curriculum.

The central theme of the course is scientific software development using top-down design with step-wise refinement, correct logic development, structured programming skills, module development and good program documentation and style. The course includes: 1) class instruction, 2) student designed software, and, 3) student interaction and self management.

Near the end of the school term a stewardship interview is conducted between student and instructor wherein the students' performance is evaluateed relative to their written objectives.

Introduction

Students of varying backgrounds often enroll in classes where all participants are given the same instruction, assignments and exams. Student achievement is typically measured relative to the entire class or group of classes rather than according to the student's individual

performance. Student achievement is commonly evaluated with only one objective measure such as true/false, multiple choice, or short answer completion, thus greatly limiting the perspective of student learning.

Because of time and curriculum considerations, students are typically kept in an educational lock-step with little allowance for individual thinking styles, backgrounds or motivation. In addition, the skill acquisition rate is commonly time-set the same for all. Seldom is consideration given to individual agency and stewardship wherein a student is allowed personal responsibility for selecting and utilizing learning activities within their personal control. The common learning model is often 'one size fits all,' with every student pressed into the same academic mold. In order for one to become self sufficient, independent and personally productive, one needs to gain experience administering and managing ones own time, energy, responsibilities and resources. This is central to the philosophy of individual stewardship and essential to programs for the gifted and talented.

A steward has been defined in Webster's New Collegiate Dictionary (1) as "an administrator, or . . . a manager." Stewardship is therefore the administration or management of those things in one's life for which one is legitimately responsible.

In a classroom, it is important that the teacher's and the students' stewardships be clearly understood by one another. It is also important that students be given the freedom to manage activities within their own stewardships. A wise leader once suggested that whenever one has supervision or direction over another person's life a good plan to follow is to "teach correct principles, and let them govern themselves." (2) The Five Stewardship Principles or Five Principles of Supervision were developed to implement that admonishment:

1. Teachers teach correct principles. (Rules, expectations, and objectives must be reasonable and consistant. From a physical science point of view, this means that the validity of all rules are experimentally verifiable.)

2. Students set their own classroom goals in harmony with correct principles taught by their teacher.

3. Teachers prepare themselves to be a source of help and to be available to give help to their students.

4. Students ask for help when it is needed; teacher responds by providing assistance.

5. Students give an accounting of their stewardship (They report their activities and share their successes).

Description of Course

Computer Science 231, at Brigham Young University (BYU), is designed to provide the student with advanced skills in using the FORTRAN programming language to develop quality scientific computer software of maximum value with a minimal investment of time. The course assists students to develop good programming methodology including structured programming skills, top-down design, composite module development, and step-wise algorithm refinement. A key objective is the generation of reliable software which is error-free from logic inception, error-free even after extensive modification, and software which can be easily understood and modified by a technical peer.

The course is structured around the Five Stewardship principles with students receiving personal responsibility for selecting and utilizing learning activities under their own control. The first student assignment is to prepare and submit an Individualized Education Program (IEP). This document describes each task that the student proposes to undertake during the semester and defines the point value of each. Figure 1 is a copy of the IEP form each student utilizes to define these tasks. The instructor or teaching assistant (TA) utilizes this form to record achievement scores for each student.

As may be seen in Figure 1, the IEP contract includes IEP preparation, class preparation, attendance and participation, a program notebook, selected software skill development problems, a team project and class presentation, and an individual project and class presentation. For tasks with point values varying from zero to a maximum value, students may select a value within the provided range of values, and record this value under the heading "point value." Tasks with a single specified point value are recommended for all students. Less than half of the 100 total points which each student selects, represent the same tasks for each student. Other IEP tasks are individually selected by each person. As work is completed and submitted to the course TA for grading, a score value is entered corresponding to the IEP item in the column "score and date completed." The last class responsibility is to attend a stewardship interview with the

FIGURE 1 CS 231 INDIVIDUALIZED EDUCATION PROGRAM (IEP) FORM

(Please submit two copies prior to 1 February 1987. Changes may be made with the consent of the course TA until 1 March 1987.)

Name
Phone

Select from the following to obtain a total point value of 100.

Description	Points Possible	Point Value	Date Due	Score & Date Completed
IEP Preparation and				
approval	3	JAN		
Payroll	0-7.5	15FEB		
Selected Text problems	0-30	15MAR		
Spaghetti	3	JAN		
Calendar	5	FEB		
Team Project				
& Presentation	0-25	6APR		
Literature review				
& report	0-10	MAR		
Individual Project				
& Presentation	0-40	6APR		
Program Notebook	3	6APR		
Class Preparation	10	6APR		
Attendance	10	6APR		
Participation				
& Presentations	5	6APR		
Attend Stewardship In-				
terview	3	6APR		

Total Score & Grade

Approval and Date:
Note: 1) Late = -10% per day until -50%
       2) Payroll, Spaghetti & Calendar are names of programming projects.

course instructor wherein the student's performance for the entire course is compared to his or her IEP course design. A student performance rating (grade) is computed at this time. At the end of this interview, after the grade has been computed, the student is asked what went well in the course and what suggestions he or she may have to improve it. Class instruction and interaction sessions consist of discussion of software development principles and applications, with students having significant responsibility for discussion preparation and group interaction. Student acquisition of a commitment to practice good software development skills is also an important class interaction goal.

The laboratory consists of preparation of software for the solution of problems from the tasks listed in the Individual Education Program [IEP]. Copies of (class discussion) overhead transparencies are used as a set of class notes and may be purchased by each student at the beginning of the semester. Help sessions and software evaluation services are provided by teaching assistants (mentors). The laboratory consists of two rooms containing IBM 3277 terminals to an NAS 9000 main-frame computer. The FORTRAN compiler is WATFOR77, obtained from WATCOM Products Inc. in Waterloo, Ontario, Canada. The software file editor is interactive and the program execution is batch. Program editing, file maintenance, program execution, and viewing and printing output results are all controlled from the students' terminals. Assessment of background FORTRAN syntax skills is determined through the use of computer-graded exams taken in the campus testing center.

Results & Conclusions

Some students, when faced with the realities of self directed skill development, are confronted with the natural consequences of procrastination. Students not accustomed to stewardship and responsibility for their skill mastery activities have difficulty setting and achieving goals in a fixed time interval. However, those who develop good stewardship and self mastery skills perform well and express very positive responses regarding their problem solving experience in this course.

When students are given the freedom and responsibility for their own stewardship, serendipity occurs. Funk and Wagnalls Standard

Dictionary [3] defines serendipity as "the faculty of happening upon or making fortunate discoveries when not in search of them. [Coined by Horace Walpole (1754), in The Three Princes of Serendip (Ceylon), the heroes of which make such discoveries.]" In other words, when rules and expectations are clearly understood by students and they are trusted to pursue objectives in accordance with their own learning styles and personal goals, then wonderful results occur along the way in terms of unexpected insights, perceptions, learning outcomes and perceived values.

In CS 231, each student is encouraged to prepare a few simple problems in order to develop basic skills of software design and FORTRAN syntax mastery. Serendipity occurs as they successfully formulate an individual or group project, struggle and strain as they put it together, and then taste the joy of success as it finally blossoms with interesting and informative results. Many of the class project reports are outstanding because of student involvement and the vicarious experience of other class members partaking of the enthusiasm and success that come from well invested self directed time and effort. Often, the learning that students experience while working on their own identified IEP goals fosters a serendipity of insightful and exciting thought and product. This phenomenon is a facet of creativity and may lead to new inventive ideas. When an individual's thought processes are free through the pursuit of goals that are purposeful and meaningful to that individual, serendipitous consequences arise.

In the final stewardship interview it is observed that most students end the course with a positive view of their experience. Typically they are very supportive of the course structure and design. Students like the freedom that comes with designing their own course and the responsibility and challenges that result from doing what they themselves decide to accomplish. When students have a clear understanding of what is expected, especially when they participate in the preparation of the expectations, students will commonly rise to the challenge and move their level of performance upward. They perform best as they experience the fruits of success which result from applying their time and resources to tasks which they themselves define, direct and evaluate.

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The Computer In Creative Mathematics

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We are on the threshold of an exciting era in mathematics education. The computer can give powerful assistance in releasing the imagination and creativity of each student. We believe that able students can master the principles and processes we normally teach and proceed directly to discover additional mathematics for themselves and, hopefully, major discoveries that extend current knowledge.

Our project is designed to empower high school girls and boys to create in mathematics by providing a liberating learning environment: computers, the LOGO language, and a teacher skillful in encouraging originality. Beginning a longitudinal project in 1985 we are giving juniors and seniors the freedom and challenge to develop their own ideas.

We are using primarily the educational philosophy of Jean Piaget and the methodology of Seymour Papent, applying their ideas in teaching youth who have had mathematics courses through calculus. We select from these students the ones who have demonstrated the ability to conceptualize in mathematics and who wish to participate in this project.

One period every day during the fourth quarter is reserved in the computer room for the project. The teacher explains that the students now have the opportunity to explore any aspect of mathematics that is in reference to mathematics they have seen in the daily news-

papers. Finding an interesting question one wants to pursue seems to be difficult. The choice should be based on the student's own curiosity. The teacher may suggest problems that need investigating and hold brain-storming sessions, but is careful to avoid making assignments. He or she promotes open-ended investigation with no preconceived result.

Even a result that contradicts current information is acceptable. The emphasis is on the process involved in coming up with something new, a "significant discovery" or, at least, something new to the student, called a "small discovery."

During the past three years, we have detected what we consider "small discoveries such as the following:

Todd - developed his own "building block system" starting with the basic grid, modifying it and exploring the changes.

Joseph - thought of using graphics to prepare all the letters of the alphabet and storing them for future use.

Andrew - noticed the changing tones of the computer at 15,000 - "ticking sounds" from 15,00 up to 19,753 and "chimney sounds" from 15,000 down. This observation led him to "fooling around with noises." Eventually, he designed a piano keyboard on the screen which was tuned for sharps and flats and had spots for which keys to press. The idea is now used by the music teacher in music classes.

David - combined different parts from all curves on the disc and developed a unique curve for which he could try to write the formula.

Russell - found no formula for constructing a sine curve so he thought he could make his own by alternating to semi-circles. After trials he decided his assumption might have been wrong to start with!

Kris - wrote "I found I could let my mind wander and then I could construct anything I wanted to." She thought she could use the recursive curve to combine two programs. After some difficulty, she made it work.

Of course, throughout history, even significant discoveries have gone unrecognized for years. Accordingly, we may be missing them also. Our main concern now and in the future is that the students have *practice in the creative process* which will eventually enable them to extend our current knowledge.

Special Benefits of the Computer for the Education of Gifted Children

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A Neglected Research Area

It is a remarkable fact that no papers on the theme contained in the title of this paper were read at the Manila conference in 1983. It is even more striking that the word 'computer' is totally absent from the index of the 1985 Hamburg conference.

How can this state of affairs be explained? It should be borne in mind of course that, at the beginning of the information age, there seemed to be no sign of special interest in computers by those who were working in the field of giftedness. Until a few years ago workers in the field especially stressed the so-called creative side of giftedness, which was conceived of not in terms of modern information processing theory but in terms of achievements that in some 'mysterious' way manifested themselves after a period of 'incubation'. Technological thinking was surely incompatible with creative thinking!

Another point is that before, say 1980, the full potential of computers was not understood by most professionals in the field of educating the gifted. Linn (1987) formulates this as follows: "Often people assume that innovations can do no more than facilitate previous approaches to the same problem. This tendency was apparent when computers first became available. Curriculum designers im-

plemented familiar models for instruction. They used computers to replace books, producing drill and practice electronic workbooks. They used illustrations taken directly from blackboards that were reproduced by a computer.'' (p. 19, 20).

In the same vein Beasly (1984) states that: ''Very little formal research has been done on educational computing using gifted students as subjects, and although there are numerous sources to suggest that computers and gifted students were made for each other, there appear to be no sources detailing the sort of computing activities most appropriate for gifted students.'' (p. 25).

The Computer As Educator

Until recently most of the few available publications dealt with the evaluation of drill and practice programs, which, according to the then prevailing philosophy, should be given to gifted students in the framework of acceleration. Another possibility was thought to be ''learning to program'', which might be integrated with the ''learning to think'' programs. At any rate gifted students should start early.

I think Beasly is right in quoting the following from researchers in the field of information processing: ''One of the most fundamental problems in developing computer applications in education is the lack of applicable theory and models to guide the needed research.'' (p.26). It is in fact remarkable that many programs refer to knowledge acquisition as if it were based on more or less behavioristic principles of learning. Computers are being used in the tradition of programmed learning, as 'teaching machines' in fact.

Salomon and Gardner (1986) compare computers with television. They state the following: ''It is a well-known observation that each new medium of communication begins its life by first adopting the contents and formats of the media it is likely to replace or modify.'' (p. 13). However: ''. . . vast differences exist between television and computers: the former is mostly a one-way medium of communication, basically designed for entertainment and converted [. . . . . .] to education; the latter is a multipurpose, semi-intelligent, interactive tool''. (p. 13). Just as Beasly did, they stress the theoretical aspects, questions pertaining to the interaction between computer generated activities, the process of learning, and the development of cognitive functions. In their view it is necessary, for example, to study the impact that various kinds of interaction can be made to have on different users under various educational conditions; and, conversely,

how specific mental structures affect the nature of the interaction. This latter question concerns, among others, students of high intellectual ability. Quoting Salomon and Gardner again: "The goal of such an approach is to illuminate how mind and technology interact. One needs to begin with as thorough an analysis as possible of the critical features of the medium or technology [. . . . . .]. Then one needs an equally refined picture of a particular user's mind to study how the critical attributes of the former map onto corresponding attributes of the latter." (p. 14).

In my view, questions like the following: "Does the learning process advance better with the aid of the computer than with TV or teaching Machines?' should not be posed. Instead researchers should seek to relate the most essential characteristics of the computer to corresponding cognitions. One of these characteristics is, of course, the possibility of interaction.

In April 1986 Sternberg was still very "realistic" about this potential for interaction when he stated that: "In the domain of teaching, I am not confident we have gone far beyond slightly archaic notions of programmed learning in the use of the computer. Certainly, there exists a range of educational software, and this range is increasing every day. But for the most part, it is not truly adaptive. Although the computer responds to individual responses of the program user, the learning of students is not qualitatively different as a function of, say, a learning style computed by the computer, or even quantitatively different as a function of speed of learning." (p.17). Linn (1987) also concludes that "computer tutors are being developed which can diagnose and model human performance and thereby provide explicit feedback to the learner on welldefined problems. At present such tutors follow student behavior closely and intervene as soon as a problem arises. [. . . . . .] Much work is needed before similar tutors could be created for openended problems or verbal problems" (p. 30, 31). In other words, the as yet unrealized potential of computers is delaying their use in the special education of gifted students.

Differentiated Education

In addition, there is another problem to be solved, namely, the problem of differentiation in education, i.e. the management of mixed ability classes. In fact, our domain of interest is located in the intersection of the three domains represented in figure 1 following:
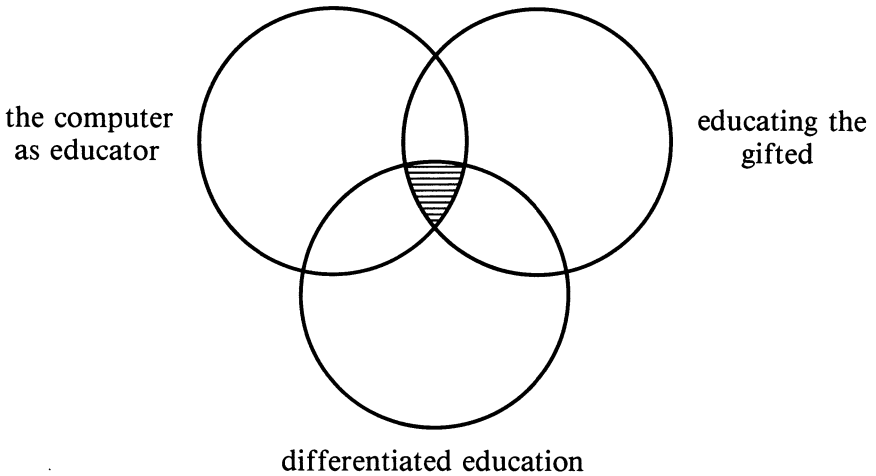
FIGURE 1.

As far as I know, in the overwhelming majority of cases worldwide, instruction pertaining to the same subject matter is given in front of an assembly of all the relevant students. The main reason for this is, of course, efficiency, notwithstanding the possibility that the same instruction may be differentially experienced by different students and that it may therefore lead to different learning outcomes. At the same time, as everybody present here knows, practically all over the world special arrangements for gifted students (special schools, special classes, "pull-out classes" and the like) are rejected if the arrangements in question are not made in the context of differentiated education for all students.

Education of the gifted in the framework of Renzulli's "revolving door model" has, in Europe for example, only few supporters. The gifted students are pulled out of their classes, a special (extra) teacher is needed and teachers in the regular classes should be even less motivated to take differentiating measures than they already were before. Schools which are structured according to the ideas of Montessori, Petersen (Jenaplan) and Parkhurst (Dalton) etc. have more opportunity to give special attention to gifted students. As we all know, systems such as IPI (Individually Prescribed Instruction) by Glaser and Wang, PLAN (Program of Learning in Accordancy with Needs) by Flanagan and IGE (Individually Guided Education) by Klausmeyer were not one hundred per cent successful in the United

States. In Europe only very few experiments were carried out in these directions. Personally, I expect more success from a system that works with a core curriculum and the possibility for the weaker students to repeat and for the better students to enrich their lessons (CRE). In the context of computers, this means that every student learns to handle computers but that the better students are given the opportunity to carry out more complex activities.

Educating the Gifted

There is considerable agreement among experts as regards the way of organizing the teaching-learning situation of gifted students (i.e. in terms of "more complex activities"). Beasly, for example, quotes Passow's seven principles (Passow 1982). I shall recall five of these here:

1. Focus on complex study of themes that integrate knowledge.
2. Development of productive thinking skills.
3. The constant exploration of changing knowledge.
4. Exposure to and use of specialized resources.
5. Promotion of self-initiated and self-directed learning.

This means that for gifted students a teaching-learning situation with a computer as educator should be characterized by these seven principles. However, if we look more closely at these principles, it is remarkable that prominent instructional psychologists such as Resnick and McKeachy consider these kinds of principles valid for all students. Resnick (1987) rejects a division between 'low literacy' (schools serving the masses) and 'high literacy'. In order to realize this goal: "The current educational challenge requires more explicit theories of thinking processes and of instruction in those processes, theories that can guide educators as they attempt to meet goals formulated in an elite educational system within a system intended for everyone" (p. 417-418).

Resnick's criteria for higher order thinking — i.e. the learning goal for everyone — are the following. Higher order thinking is non-algorithmic, complex, it yields multiple solutions, it involves the application of multiple criteria, uncertainty, finding structure in apparent disorder and, last but not least, it means self regulation. In other words, the full potentiality of the computer as an educator could and should be used for all students — if only we had the right theory of learning and teaching! This point of view can also be found in Linn's

report of a conference on technology and teacher education "Education in the information age: The challenge of technology' (1987). Now that computers are widely available, it is not worthwhile for schools to cover more and more information in their courses. The curricula should be changed: "In mathematics (for instance), computers can do long division and reduce complex equations. Students should spend less time learning these skills and more time learning how to set up equations and to analyse relationships among different phenomena, thereby focusing on problem solving rather than on mechanics". Incidentally, the same is valid for language learning, with word processors being able to identify and correct misspellings; or for history, with computers providing access to large data bases, etc. Linn's report continues: "Changing the curriculum will change the nature of learning and instruction. Skill in reasoning and problem solving involves a great deal of autonomy. [. . . . .] Learners who understand the nature of problem solving, and who realize that problems often have many solutions, will be far more effective than those who believe problem solving involves following a discrete set of a memorized algorithm" (p. 12, 13). To reach this objective teachers have to change roles: "They must be able to support and encourage autonomous, self-regulated learning. Such teachers must be able to help students recognize challenges and coach or tutor them so that they achieve their objectives. To accomplish this, they must have responsibility for designing and refining the curriculum, in conjunction with experts on learning and instruction and on using technology" (p. 26).

Constraints

I think the report looks forward to the 21st century because, and I quote from the same report: "Teachers lack time to reflect on the nature of the curriculum and to create new materials for their students. They are not trained to be responsible for the curriculum, nor are they helped to develop a theory of instruction that includes the role of the various resources available to them [. . . . .] The structure of our educational institutions encourages an isolated and embattled population, unable to exercise their creativity adequately and unprepared for appropriate responsibility."

Returning now to the three circles in fig. 1, we must conclude that in the theory and practice of all three domains not only details are

lacking but essentials too. There are criteria for educating the gifted, but in fact research into the learning activities of gifted students has hardly begun.

As regards the introduction of computers in schools, we can say that the idea of the computer as an educator is promising but the adequate course-ware is scarce and its development expensive and time-consuming. Moreover, it lacks a modern theory of learning. Valid knowledge about "how technology and mind interact" (Salomon & Gardner 1986) is not to be expected at short notice. The condition of a teacher education program for the "information age" has not yet been fulfilled. Even worse is the situation concerning differentiation in the classroom. Worldwide, teachers lack the skill to manage mixed-ability classes. Education of gifted students — with or without computers — will be difficult to achieve. Looking at the intersection of the three circles in fig. 1 it is easy to agree with Beasley, who concludes his thesis as follows: "It would be fair to say that if the question is: 'What needs to be investigated about computers in the classroom?', the answer is: 'Everything' " (p. 180).

Nevertheless, if education is directed at 'higher order thinking', again and again it will be proved that some students, already at a very early age, are capable of autonomous learning.

Future Research

To be "ecologically valid", research — especially developmental research — should therefore be carried out in mixed-ability classes, where differentiating measures can be taken. Because of differences in learning activities (and the learning process) there should be "some distance" between the gifted and the other students, although this distance should be only moderate; the latter because of the psychological and technological goals of education (i.e. higher order thinking with the aid of the computer as educator).

Following this line of reasoning we propose to give gifted secondary school pupils of 14 years of age an enriching program. Enriching means that information processing should take place in the framework of problem solving situations. These problems should not be convergent-reasoning problems but design problems i.e. problems without unique solutions. The student should acquire designing skills and put these into effect. Learning to program meets these requirements, provided that programming is conceived of as a designing ac-

tivity and not as a coding activity. In this kind of programming the accent lies on the finding and defining of problems in the subject matter.

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The Effectiveness of Mathematical Creative Thinking Training on Gifted Students in Taiwan Elementary Schools

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The training of creative thinking has been a worldwide educational trend in the past twenty years. Research studies have shown that creative thinking ability can be enhanced through training (Torrance, 1972; Guilford, 1986; David, 1982.) Both long term and short term creative thinking training programs, many with systematic instructional activities and workbooks, have been extremely successful in the United states (Mansfield, Busse & Krepelka, 1978).

Similar findings have been obtained in elementary school language arts teaching in the Republic of China (Mao & Chen, 1986.) The present study attempts to extend the creative thinking skills training program to mathematics instruction in gifted programs. The purpose of the study was to develop creative thinking skills instructional materials for third and fifth grade gifted classes, and to examine learning outcomes and student responses during program implementation.

Four hypotheses were tested:

1. Third grade gifted students participating in the Creative Thinking Skills Mathematics Instruction Program (CTMP) should score significantly higher than control group students in figural and verbal creative thinking tests.
2. Fifth grade gifted students participating in the CTMP should score significantly higher than control group students in figural and verbal creative thinking tests.

3. Third grade gifted students participating in the CTMP should have significantly higher mathematics achievement scores than control group students.
4. Fifth grade gifted students participating in the CTMP should have significantly higher mathematics achievement scores than control group students.

METHOD

Experimental Design

A pre-post test control group design was used.

Subjects

All subjects were students enrolled in gifted programs at five Taipei City schools. In order to participate in the gifted programs in Taipei City, students must score above the 80th percentile on group intelligence tests and have IQ scores above 130 on individual tests.

There were 118 third and fifth grade gifted students in the five schools. From each school, six students were randomly selected from each of the two gifted classes to participate in the CTMP, with the consent of their parents. These 80 students were the experimental group.

From the remaining students, six students were randomly selected from each of the two grade levels to form the control group. In one of the schools, there were only 11 students in each gifted class, so there were only five control subjects per class. Therefore, there were altogether 58 students in the control group.

Materials and Instruments

The CTMP was specially designed for this study by an experimental study group. The study group consisted of 20 outstanding professors. In a one-week workshop, they worked together to design instructional activities according to the standard mathematics curriculum and the ATDE (Ask-Think-Do-Evaluate) model of mathematics creative thinking provided by the investigator. The program covered 12 weeks with 9 units in third grade and 13 units in fifth grade, respectively. Both programs emphasized creative problem solving strategies and creative teaching methods.

A chinese version of the *Torrance Tests of Creative Thinking* (TTCT) were used to assess creative thinking skills before and after training. The figural form B and Verbal Form B were used in the pretest. Figural Form A and Verbal Form A were used in the post test. The figural tests yielded sub-scores on fluency, flexibility, originality and elaboration. The verbal tests yielded sub-scores on fluency, flexibility and originality.

Mathematics achievement was assessed using four tests compiled by the investigator. There was one test for each semester for each of the two grade levels.

A self-designed questionnaire was also administered to obtain student reaction to the creative thinking mathematics instruction program. The percentage of each response type on a Likert type scale for each question was used in data analysis.

Procedure

Over a 12 week period in the second semester, the sixty students in the experimental group attended 12 Wednesday afternoon sessions of mathematics creative problem solving training camp at a Taipei City School. Each session lasted two hours. The control group received no training in addition to regular program activities at their own schools.

All subjects were given pretests at the beginning of the study and post tests after the 12 weeks. The experimental group was administered the ''Student Reaction Questionnaire: at the end of training camp.

An evaluation meeting attended by students, parents, teachers and the experimental study group was also held at the end of the training camp. Creative Thinking Ability

The data on the figural and verbal forms of the TTCT were treated by analyses of covariance on each of the post test sub-scores with pretest scores as covariates. On the figural sub-scores, the third grade experimental group scored significantly above the control group in fluency, flexibility and originality ($F = 6.87$, $p < .05$; $F = 5.4, p < .05$; $F = 11.30, p < .01$; respectively). No significant difference was found for elaboration. Although the fifth grade experimental group had higher mean sub scores than the control group on all sub-tests, none reached statistically significant levels. Thus, generally speaking the 12 week creative thinking training

significantly raised the ability of the experimental group above the control group for third grade students, but not for fifth grade students.

On the verbal forms of the TTCT, no significant differences were found between experimental and control groups although there was a trend for slightly higher scores among the experimental group.

Mathematics Achievement

The effects of creative problem solving training on mathematics achievement clearly support experimental hypotheses 3 and 4. On separate ANCOVAs' both third and fifth grade experimental groups had significantly higher mathematics achievement scores than the control groups $(F = 9.805, p < .01$ and $F = 3.957$, $p < .05$; respectively).

Student Response

Results of the "Student Reaction Questionnaire" are that almost all parents and teachers were found to support the creative thinking training camp and students were also highly motivated to attend. Over 90% of the students found the camp interesting, found it more interesting than mathematics class in school, and said that the camp increased their interest in mathematics. Over 80% enjoyed questions that required them to think. Also, after participating in the camp, they thought about mathematics problems more often. Over 90% agreed that the content was appropriate that the teaching was varied and stimulating and that the teachers were easy to get along with. They felt that the camp increased their mathematics ability because the teacher gave positive encouragements, asked stimulating questions that allowed for enthusiastic discussion. They agreed that other subjects could have the same kinds of activities and expressed a desire to participate in more activities of this kind.

Among third graders, 93% agreed that the duration of the lessons was just right but only 65% of the fifth graders thought so. Perhaps class durations for fifth graders could be adjusted. Only half of the students agreed that they were pleased to make new friends at the camp.

In general, the third graders checked off "strongly agree" more often than the fifth graders, but the overall response for both grades was extremely positive. This has been the most encouraging result of the study.

DISCUSSION

Creative Thinking

1. Creative thinking instruction has been heavily promoted in Taipei City elementary schools in the past several years so that most teachers, especially those responsible for gifted students, have adopted the spirit of creative thinking instruction in their everyday teaching. Since control group students are in gifted classes that probably exposed them to creative thinking activities, the advantage of the experimental group, even with an additional 12 weeks of training, is considerably lessened. This perhaps explains why no significant differences in TTCT were obtained for the fifth graders.

2. Members of the experimental study group who designed the curricula for the training camp were not teachers in gifted programs. Although they had attended a special one week workshop on creative mathematics problem solving instructional methods and activities, they may have been unfamiliar with the special characteristics and learning styles of gifted students, so that the curriculum they designed may not have been most effective for students in this study.

    The videotapes of the CTMP revealed that while the teachers were very conscientious, each followed his or her individual teaching style and did not adhere to the principles and procedures of the course. Since the study emphasized curriculum materials, many different instructors were used in the training in an attempt to balance out the effects of individual teaching styles. Whether this was successful or appropriate requires further consideration.

3. The CTMP is based on the ATDE instructional model and strategies in combination with other curricular material currently available in the Republic of China. It was considered an enrichment program for the gifted students, but since the amount of instructional materials available is relatively limited, much of the materials used to design the enrichment program were also used in their schools. This factor diminishes the effect of the training program.

4. The emphasis of the TTCT differs from the emphasis of the CTMP, so it may not be the most appropriate valuative tool for the program. At this time, a mathematics creativity test is

being standardized by the investigator and it will be used in a follow-up of these students in the future.

5. The TTCT is widely used in the identification of gifted students in Taipei City and many gifted students have taken the test in various research studies. This over testing has probably created some negativism among gifted students and may partially explain the lack of change between pretesting and post testing in this study. This is a serious problem that must be addressed in future studies.

6. The original plan was to hold the training camp on weekends, but it was found to be inconvenient for both the teachers and the students. In the end training camp was conducted every Wednesday afternoon at 2:30 pm so that many students had to hurry to the camp after this first afternoon class. This is a major weakness of the training program. The number of students absent or late in the fifth grade class probably accounted for some of the failure of the program to increase creative thinking among those students.

Because of all the reasons given above, the first two experimental hypotheses were not confirmed. The reasons include environmental and methodological problems, but most of them can be overcome in future studies.

Although no significant differences were obtained among fifth graders, the third grade experimental subjects did better than the control subjects on three sub tests of the figural form of the TTCT. There are three possible reasons for this outcome.

1. Figural creative thinking abilities differ from verbal creative thinking abilities. Many researchers (e.g. Olson, 1977; Edward, 1979) share this view.

2. According to many elementary school teachers, the younger the student, the greater the interest in figures and drawings. Perhaps this accounts for finding differences in third but not fifth grade.

3. The greater success with third graders may be accounted for by their lower absenteeism as compared to the fifth graders.

Mathematics Achievement

The results from the present study indicate that the CTMP increases mathematics achievement. There are two implications from this finding:

1. The training program emphasizes problem solving strategies and creative thinking which are normally required in mathematics problem solving. Since the students themselves felt that it increased their mathematics ability and enjoyed the instructional activities, it is very likely that parents and teachers would welcome their implementation in the regular programs.
2. The training program was designed as an enrichment program that does not overlap with the regular curriculum so it is very appropriate for gifted programs. It is a pity that its effectiveness within the regular programs could not be assessed in this study. Furthermore, it would be interesting to see whether the effects of the mathematics program may extend to other academic subjects.

CONCLUSION

The research findings can be summarized in three points:
1. The CTMP has significant effects on the mathematics achievement of gifted students in the third and fifth grade in the Republic of China.
2. The CTMP increases creative thinking among elementary school students, especially in figural creative thinking amoung third graders. Among fifth graders no significant increases were found but the effects were in the expected direction.
3. The gifted students who attended the training camp were highly motivated. They participated enthusiastically in the discussions and reported improvements in mathematics ability. They expressed interest in participating in other camps of this nature in other subjects as well as in mathematics. Their parents and teachers were also very supportive of the program.

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Editors note: Write to the author for additional references in Chinese.

The Program to Assist Gifted Students in Mathematics and Science in Taiwan, ROC

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The science-gifted students are the valuable potential manpower to the economic development in our country. As science educators, we are more concerned about how science-gifted students can be identified and be fostered to develop their potentials.

According to the current school system in the Republic of China, there is a nationwide university/college entrance examination for senior high school graduates, and the local senior-high entrance examination for junior high school graduates. Some of the test scores of various subjects in the entrance examination issued to discriminate the passing or failing in the examination. It does not reveal a student's potential for science.

The program to assist gifted students in mathematics and science to attain a higher level of school was set up in November 1982 by the Ministry of Education. It has been implemented for five academic years. The program was divided into two categories: 1. The qualified students in grade 9 (the third year of junior high school and grade 12 (the third year of senior high school) can enter to the higher level of schools by some screening activities instead of the entrance examination.

The students who are in grade 9 or 12 have to be qualified by one of the following three criteria, can be recommended by their schools to this program (Fig 1).

(1) As his records in mathematics or one of the natural science subjects being in the top 1% in his grade, having above average creativity and IQ, and high motivation to study mathematics and natural science, qualified to be recommended by his teacher.

(2) He is recommended by the National Science Council, having a good performance in mathematics and science club held in universities which are Council sponsored.

(3) He has excellent record in the competence of mathematics or Science Work Exhibition.

There were a total of 2714 students recommended by their schools in these 5 academic years. The procedures in this program are:

(1) The National IQ test and critical thinking test. The score of both tests should be more than 125.

(2) Then students have to attend a one-week Mathematics and Natural Sciences Camp set by Science Education Center, National Taiwan Normal University which is sponsored by the Ministry of Education. During the camp, students are working with university professors in the laboratory and evaluated by the same professors.

There were a total of 897 students in these 5 years who attended the camp, and 656 students passed the screening activity. The records of these students were discussed and evaluated by the Committee which is set by the Ministry of Education. The members of this committee are professors in mathematics and natural sciences, administrative officers, and educational psychologists. There were a total of 656 students recommended by this committee to the higher level schools they wish to enter. The limitation for grade 12 students is that they should enter Departments of Mathematics or Science. There are fellowships made available by the Ministry of Education for such students to study basic science in the university. The qualified students in grade 8 (the second year of junior-high school) and grade 11 (the second year of senior-high school) can attend the entrance examination of the higher level of schools one year earlier than their classmates. The criteria of qualified students of grade 8 and 11 are the same as grade 9 and 12 described above, but their records of other subjects should be pretty good too, because they will normally compete with 9th and 12th graders in entrance examination of higher schools.

There were a total of 2067 students recommended by their schools within these years. After national IQ and critical thinking tests, 407

students were selected by the committee, who could attend the entrance examination of higher schools. But only two thirds of these students really attended the entrance examination. Most of them could pass the entrance examination and enter a higher level of school to study.

Due to their scores in the entrance examination, only a few could be allocated to the schools they desired. Therefore, there are only a total of 56 students of grade 8 and 11 going to the higher level schools within recent 4 academic years. The 5th year students have not attended the entrance examination yet.

According to our follow-up study, we found that gifted students who entered the present level of school through the entrance examination after finishing grade two studies in a lower level of school and excellent academic achievement. They adjusted very well in the higher level school. More than half of the students are in the top three in their class. On the other hand, the academic achievement of the students who entered the present level of schooling by screening activities was normal distributed. But, their performance in mathematics and natural sciences was very satisfactory. The term of "gifted student" was a pressure for some students in their study. Since each student had unique needs, the individualized guidance will be established.

Creating Scientists

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Science can be creative and creative science can be done in school and home with inexpensive and easy-to-find materials. The main ingredients of a creative science program are imagination and the willingness to let students experiment and discover answers for themselves. The approach presented in the article *Creating Scientists* offers the students opportunities to do quasi-experimental research. It is a hands-on approach, designed and carried out by students, that will stretch the creative mind and will develop problem solving and decision-making skills.

Science is a product of human beings and should be within the reach of all. The objective of science programs is to enhance the understanding of the basic nature of science, to identify science as a tool to which everyone has access and to begin to cause the participants to think about the challenges of the future.

The goal of a science program should be the development of individuals who understand how science, technology and society influences one another and who use this understanding in their every-day decision-making (Hazen, 1987).

It is the responsibility of teachers everywhere to develop science programs that are exciting, challenging, and qualitatively different educational experiences for students.

By emulating the techniques of professional scientists, students can create workable, exciting and educational beneficial experiments. Let students have the opportunity to develop their own science experiments. Use familiar objects and materials that can be found at home, around the school, outside on the playground or in a nearby woods. Encourage the students to use their imagination because imagination is the root of every man-made device. Introduce imaginative exploration or the trial-and-error method of investigation.

The following outline was developed to encourage students to become experimental, creating scientists. The program uses two outlines; one for the instructor and one for the student. A student or the teacher can serve as the instructor and complete the first outline.
1. Topic:
2. Motivation:
3. Present the problem: Ask questions related to the topic.
4. Define the problem:

Using brainstorming techniques, the student should

break the problem down into its smallest components.
5. Known Data: List all they know about the subject.
6. Form Hypotheses:
7. Presentation: Science is no a separate entity. Think of it as materials and a set of thinking skills overlapping into other disciplines. Have students think of creative ways of sharing the newly gained information.
8. Key Ideas: Make a list of all data that has been obtained. Combine what was known before the experiments began and what was learned from the experiments and from other resources.

The student's outline is divided into 14 sections as follows:
1. Topic:
2. Hypothesis:
3. Materials needed:
4. Steps to be followed for experiment:
5. Type of records to be kept:
6. Audience:
7. Method of presentation:
8. Vocabulary: Include vocabulary that might need explaining to the audience.
9. Evaluation Criterion:

10. Conference with Instructor:

11. Do the experiment:

12. Conclusions:

13. Research: List the resources and additional information on a separate sheet of paper and attach to this form when finished.

14. Evaluation:

Self:

Instructor:

Creating scientists means not only will the student be creating their own experiments and units, but the instructor will be creating young scientists. These students will develop good problem-solving and decision-making skills and will use their imagination to see things in different ways and to question processes.

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Scientists As Educators For The Gifted—A Unique Model

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The problem of education for the gifted has been, and still is, a matter of dispute. Certain educators believe that the best approach for educating the gifted is through special schools, others believe that the best model is to create special classes for them within regular schools; a third approach is to take them out of their regular schools to a special school for a short period, such as one day a week; and a fourth approach is to give the gifted children enrichment programs in the out-of-school setting.

Every approach has its own advantages and disadvantages. Those who believe in the out-of-school enrichment programs tend to believe that gifted education should not only receive treatment, but they also must be asked to give something back to their society. Isolating gifted children would not only give them a wrong idea of the real world, but such isolation would lower the level of regular classes. On the other hand, participating in after school enrichment programs gives gifted students an opportunity to satisfy their own intellectual needs, while, at the same time it does not affect their school classes.

Enrichment Programs for the Gifted in the Weizman Institute of Science

In the 1960's the Weizman Institute pioneered the development of programs for gifted and science-motivated children. One of the vi-

sions of Professor Amos de-Shalit, an internationally well-known nuclear physicist and the founder of the Weizmann Institute's Department of Nuclear Physics and the science Teaching Department was for scientists to work with talented high school students in three directions: a) a science fair, an annual program where students worked on models, inventions, and projects; b) weekly science clubs for science-oriented youngsters and; c) sumemr science camps for talented students.

After some years of activity, the Weizmann Institute, which is a research institute, decided to establish the YOUTH ACTIVITIES SECTION. This section, takes care of all the educational activities with school children which are run in the Institute. Most of the other Israeli universities and research institutions have followed this lead, and today Israel hosts a national network of extracurricular science education, in which each institution runs weekly science clubs, summer science camps and special programs.

In the Weizmann Institute the teachers of all the activities for youth are either scientists or Ph.D. students. The teachers are called instructors and not teachers, since their perception of teaching is, in most cases, different from that of a regular teacher. With this approach we bring into the educational system a special source of manpower which under regular circumstances would never be involved with youth. Scientists, even if they are good teachers, do not usually work in the regular school system, but are more able to get involved in the extracurricular framework. About 150 scientists work in the various programs of the Youth Activities Section.

What is Unique in this Approach

Schools are in most cases large and have to cater to the average student. Extremes, such as gifted children on one hand and slow learners on the other hand, have difficulties within this framework. It is very difficult to change a school curriculum and update it, especially in the sciences, where changes in the field are very rapid. School curriculum has its own core content. It is almost impossible to discard the old content and initiate an entirely new content, since new concepts are build on the basis of what was learned before. One cannot start with recent developments about the "zpp of particles" from the field of new developments in elementary particles without learning "old" elementary physics. In addition, it is not very easy to update the teachers who teach the same curriculum over and over

again. Schools also have difficulty in renewing old equipment and in purchasing new equipment for new curricula. Thus science experiments done in school are usually dull and predictable; such experiments do not give the student the sense of exploration and the joy of discovery. This situation does not cater to the bright and curious students.

In the extracurricular framework with scientists as educators, the situation is very much different. A scientist, who is educating the gifted and the curious student, sets high standards and learning takes place in a personalized atmosphere of excitement and creativity. Since the setting is extracurricular and informal, the programs are very flexible and the student is challenged with subjects and experiments which are at the frontiers of science. Another important feature of this extracurricular framework is the chance for students to use advanced and sophisticated equipment which is unavailable in their schools.

But most important for the children is the possibility to get to know an actual scientist, to learn about his/her approach to scientific thinking and processes, how to ask a question and plan an experiment.

Description of the Extracurricular Science Youth Programs in the Weizman Institute of Science

The Weizman Institute of Science is a center for scientific research and graduate studies in biological and physical sciences. In all, about 8,000 school students participate in programs run by about 150 Institute scientists. The programs can be separated into two inter-related streams:

1) Programs for the gifted and talented.

2) Programs for science oriented and motivated youngsters. The program for science-oriented children can be considered as the base of a pyramid whose top is gifted children.

1) Programs for the Gifted

It is important to note that the identification of gifted children is not done through intelligence tests. Rather, candidates for the various programs are chosen via interviews and/or specific subject-matter tests.

1.1 Weekly Science Clubs — annual courses in biology, chemistry, physics, mathematics and computer sciences. For ages 10-18.

1.2 Summer Science Workshops

1.2.1 For Israeli student - age 17

1.2.2 The International Program. Ages 17-20.

1.2.3. For Math and Music enthusiasts. Ages 12-13.

1.3 National Junior Mathematics Club - "Math by Mail" club, catering to mathematics fans from 4th-9th grades.

1.4 Olympiads (local and international) mathematics olympics for high school students.

2) Programs for Science-Oriented and Motivated Youngsters

2.1 Weekly Science Clubs

2.2 Science Experiment Bank - provides ideas, booklets, and inexpensive scientific materials to science clubs at distant schools.

2.3 Field School of Science - an intensive one-day course of demonstrations, discussions and guided laboratory work, introduces high school students (11th - 12th grades) to topics at the frontieers of current research.

2.4 Garden of Science - outdoor exhibits demonstrate basic principles of mechanics, optics, energy and other subjects to junior high school students.

2.5 Science Fair.

2.6 Science Journals in physics and mathematics for high school students.

The Gifted and Talented Second Language Learner

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Many authorities in education recognize linguistic abilities as manifestations of giftedness (Miller and Price, 1981; Bartz. 1982). The multicultural and multi-lingual nature of our society has added further dimension and special significance to the successful learning of languages (Bullivant, 1973; Grassby, 1978).

This paper examines means of identifying gifted and talented second language learners and discusses characteristics of the linguistically gifted student.

716 Year 8 second-language students (13 to 14 years of age) from 34 classes in 15 Australian post-primary schools were tested and surveyed. The following instruments were used:

a) Student Questionnaire
b) Pimsleur Language Aptitude Battery
c) Student Interviews
d) Teacher Questionnaires

The Student Questionnaire

The student questionnaire required students to indicate their own ability in various aspects of language learning, including oral and

written work, and listening skills. These questions involved self nomination.

Students were then required to nominate individual students from their language class whom they felt to be most adapt at nominated aspects of language learning. These questions involved peer nomination.

The Pimsleur Aptitude Battery

The Language Aptitude Battery is a widely accepted norm-referenced test (Rubin, 1975; Neufeld, 1979) which examines aspects of motivation, English vocabulary skills, language analysis skills, ability to discriminate sounds and skills in sound symbol associations.

The Student Interviews

In order to ascertain additional information about learning styles and parental attitudes and influences, a sample of students from the 'top 5%' groups and from the control group was randomly selected for interviews.

The Teacher Questionnaire

A Teacher Questionnaire comprising a checklist of 50 statements describing the characteristics of gifted and talented second language learners was administered to the language teachers of each of the 34 Year 8 language classes partaking in the study (modified from Carlson, 1981).

The instruments used hence incorporate widely accepted methods of identifying gifted students; namely a combination of teacher nominations and a teacher checklist, academic results, self and peer nominations and a norm referenced test (Victorian Gifted Children Task Force, 1981; Sellin and Birch, 1981; Larsson, 1981).

This choice renders the study to be of relevance and significance to educators in regular school settings and is nevertheless sufficiently stringent to adhere to widely accepted definitions of giftedness.

Briefly, a definition of the gifted second langauge learner: According to Pimsleur (1966) a gifted language learner is defined in terms of exceptional verbal intelligence, a strong sense of motivation and exceptional auditory memory.

Having surveyed and tested 716 students, I now proceeded to identify the students who rated in the top 5% of firstly the SELF NOMINATION and secondly the PEER NOMINATION sections of the Student Questionnaire. Thirdly, the students rating in the top 5% of the PIMSLEUR L.A.B. were identified. Table 1 provides a breakdown of the compositon of each of these three groups.

TABLE 1: NUMBER OF STUDENTS IN EACH OF THE "TOP GROUPS"

TOP GROUP	Boys	Girls	Total
1. SELF nomination :	11	25	36
2. PEER nomination :	13	25	38
3. PIMSLEUR Lang. Apt. Batt.:	10	23	33

The responses of the students in each of the 'top 5%' groups have been carefully examined and compared with the remaining 95% of students.

Major Findings

It was heartening but perhaps not surprising to see (Bartz, 1982; Carlson, 1981) that a highly statistically significant number of both the boys and the girls in the SELF nomination group as compared to the remaining 95% of the students nominated second language as one of their three favorite school subjects. Similar results for this group indicated strongly that both boys and girls looked forward to their language class.

In the top 5% of the PEER nominations and similarly in the top 5% of the Pimsleur Language Battery, a highly statistically significant number of the girls compared to the boys designated language as one of their three favorite subjects (.05).

In order to ascertain how gifted and talented second language learners were perceived by students, the Student Questionnaire asked students to nominate five adjectives or phrases which, in their opinion, would describe a gifted or talented second language learner.

For ease of presentation, the adjectives have been grouped under 19 key words. Table 2 lists these groups and indicates the ranking attributed by the 716 students to each of these.

TABLE 2: RANKS ATTRIBUTED BY THE 716 STUDENTS TO EACH OF THE 19 ADJECTIVE GROUPS

KEYWORD RANK	RANK	KEYWORD	RANK
intelligent	1	gifted / talented	11
conscientious	2	tries	12
listens	3	contributes	13
oral work	4	general education	14
motivated	5	other positive adjectives	15
comprehension	6	background of parents	16
grammar	7	negative adjectives	17
natural flair	8	exc. academ. results	18
personality	9	techniques used	19
memory	10		

It can be seen that the group as a whole perceived the gifted and talented second language learner in a most positive way. Four of the 19 adjective groups relate specifically to second language learning:

Excellent oral work	ranked	4th
Excellent at grammar	ranked	7th
Has natural flair	ranked	8th
Background of parents	ranked	16th

The adjectives most frequently nominated by the three subgroups in rank order are illustrated in Table 3:

TABLE 3: ADJECTIVES MOST FREQUENTLY NOMINATED BY THE SUB-GROUPS

GROUP	RANK	KEYWORD
SELF NOMIN.	1	INTELLIGENT
	2	CONSCIENTIOUS
	3.5	LISTENS
	3.5	COMPREHENSION

GROUP	RANK	KEYWORD
PEER NOMIN.	1	INTELLIGENT
	2	ORAL WORK
	3	CONSCIENTIOUS
	4	LISTENS
PIMSLUER	1	ORAL WORK
	2	COMPREHENSION
	3	INTELLIGENT
	4	MEMORY

It is interesting to see that "excellent memory" was ranked highly only by the PIMSLEUR group. In contrast, the adjective "intelligent" appears in all three groups. "Excellent oral work" is stressed by two of the groups, as are the adjectives "comprehension," "consciencious" and "listens."

A comparison was then made between the adjectives chosen by the three "top groups" and the control group and a number of significant results became apparent. (◀.05):

- Excellent at Grammar was nominated frequently by both PEER and SELF nomination groups.
- Motivation was only stressed by the SELF Nomination group.
- Excellent Memory was not stressed by the PEER nomination group.
- Excellent Oral Work was not stressed by the SELF nomination group.
- Has a Natural flair for languages was only emphasized by the boys in the PIMSLEUR group.
- The PIMSLEUR group stressed comprehension and personality.

It is most interesting to now compare these perceptions held by students with those expressed by the langugage teachers. The major findings of the Teacher Questionnaire are cited in Table 4:

TABLE 4: RESULTS OF THE TEACHER QUESTIONNAIRE

1) 100% of the 29 teachers surveyed believed that the gifted and talented student
   a) is highly motivated
   b) has an excellent memory
   c) quickly grasps new concepts in skills of listening, speaking, reading and writing.

2. 93% of the teachers believed that such a student
   a) demonstrates an active curiosity
   b) is not easily distracted
   c) gets meaning of unknown vocab. through context
3. 89% of the teachers believed that such a student
   a) is well organized
   b) manipulates complicated grammatical structure when speaking and writing in the second language
   c) is highly acurate in the 4 major language skills of listening, speaking, reading and writing.
   d) handles well any new material.
4. 83% of the teachers believe that the gifted and talented student is generally recognized by peers to be talented in the language.
5. 79% of the teachers believed that the talented language student generally realizes that he or she has specific talent in the language.

The characteristics identified by the teachers are in many ways similar to those nominated by the students, although the teachers more frequently stressed specific language skills.

Many other interesting findings have emerged from this study.

The relevance or significance of academic results in "language" is another integral factor in the identification process of gifted and talented students. An examination of the results of the separate groups in this study has revealed that a significant proportion of the "top groups" in comparison with the control group, have obtained excellent results in second langugage in their last school report.

Table 5 indicates the percentage of students in each group who obtained an "A" for language in their last school report.

TABLE 5: PERCENTAGE OF STUDENTS OBTAINING "A"
FOR LANGUAGE

GROUP	"A" FOR SECOND LANGUAGE %
SELF NOMIN.	66.67
PEER NOMIN.	89.47
PIMSLEUR	87.88
REST (CONTROL)	38.00

It can be seen that the students comprising the top 5% of the Pimsleur group and the Peer Nomination group were academically more successful in "langugage" than the students in the Self Nomination group. All three "top groups" were more successful in "language" than students in the control group. In addition to examining actual school results, one of the questions on the Student Questionnaire required students to rank themselves according to how good they believed themselves to be at "language" in comparison to their class peers.

Table 6 provides the self rankings of students in the various groups.

TABLE 6: PERCENTAGE OF STUDENTS RANKING THEMSELVES TO BE EITHER 1ST, 2ND OR 3RD BEST IN THEIR LANGUAGE CLASS

GROUP	% OF STUDENTS
SELF NOMIN.	58.33
PEER NOMIN.	71.74
PIMSLEUR	48.48
REST (CONTROL)	18.28

Table 6 indicates clearly that a significant proportion of the "top groups" perceived themselves to be much more successful language students than the students in the control group.

Restrictions in time and space unfortunately limit the presentation and discussion of further findings. I would like to summarize.

I have demonstrated that gifted and talented second language learners share certain characteristics, which are specific to language students and which are not generally attributed to gifted students in other academic areas.

Such characteristics include exceptional auditory memory, superior verbal skills and grammatical sensitivity. A strong sense of motivation and a conscientious approach to work also play an integral part in the life of a talented second language learner.

A significant number of these students look forward to their language class and many rank language as one of their favourite three subjects. Many of these students are successful at school.

With the multicultural and multilingual nature of our society, our educational system is stressing (or perhaps in some countries should

stress more) the study of second language learning. Hence educators and parents should be assisted in encouraging gifted and talented second language students to pursue their language studies and to strive for their potential.

Finally, this paper has demonstrated that a combination of tests and questionnaires for students and teachers can be most successful in identifying second language students whose talents may otherwise remain unidentified and untapped.

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Teaching Reading Beyond Zebra
In Kindergarten

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The importance of learning to read cannot be understated. It is the one skill that is absolutely vital for success and achievement in school and, increasingly, in life. However, despite its importance there is no clear-cut consensus concerning when, how, and to whom formal reading skill should be taught.

This report is based on a series of research projects conducted by members of the University of Tulsa faculty and the Tulsa Public Schools.

The first study (Kelble and Hanson, 1987), conducted during the 1983-84 school year, concerned two kindergarten classes in which formal phonics based reading instruction was a part of the regular traditional program. The major concern was the reaction of the children to a formal reading program—emotionally as well as academically. In the same study the vocabulary scores of 53 children were compared with vocabulary scores of a similar group of Denver children given the same vocabulary test, Ammons Full Range Picture Vocabulary Test, in 1949 (Ammons and Huth, 1949).

The scores for the 1983-84 experimental group ranged from a mental age of about 6 to a mental age of 13.5. The mean score for the 1984 group translated into a mental age of 9—2 and 1/2 years above

the 1949 group. The study also indicated that no undue pressure had been placed on the children. The children were reading by the end of the school year; loved it; and showed no signs of stress. Discipline problems were minimal.

In the 1984-85 school year Writing to Read was implemented in the kindergartens of 25 of the Tulsa Public Schools. Many of the teachers were reluctant to use the program because of the large number of children in their classrooms who had demonstrated a developmental age of 4 or below on the Gesell Developmental Screening Test (Kelble and Hanson, 1985). Zenke and Keatley (1985) analyzed the effects of ''Writing to Read'' on the children's Metropolitan Readiness Test scores (pre- and post- ''Writing to Read''). They note, ''The gains observed for children defined as developmentally young amounted to 27.9% for children with a developmental age of 4 or less and 29.3% for children with a developmental age of 4 1/2.''

In the spring of 1986 Hanson, Siegel, and Broach assessed the reading and vocabulary skills of approximately 4,000 high school seniors from 24 school districts in ten states. Approximately one-half of the seniors in the study had been taught to read in kindergarten in 1973-74. The progress made by these students had been documented in a series of national evaluation studies (Hanson, Lahman, and Bailey, 1981; Hanson and Resta, 1971; Hanson and Schutz, 1975, 1976, and 1978; and Hanson, Schutz, and Bailey, 1977).

The results of the 1986 follow-up study were conclusive: a well designed and carefully implemented kindergarten reading program can not only increase the reading skills of high school students, but also decrease their need for remediation. In addition, the high school students who had participated in the 1973-74 kindergarten reading program had more favorable attitudes toward reading and better grades and attendance than those students who had not received the kindergarten reading instruction. Furthermore, this pattern of results was consistent across school districts and racial/ethnic, gender, and socioeconomic groups.

These studies clearly refute the long-standing notions of those who have cautioned against providing formal reading instruction to children prior to the age of 6 for fear of producing long-term negative effects in learners. Not only did the advantaged students benefit from the kindergarten reading instruction, but so did the disadvantaged groups.

The argument that teaching young children to read and write is stressful to them, will cause trauma to the organism, lead to lack of interest in school, and, in the most severe cases, eventually will cause suicide is sheer nonsense. It is not what is taught but how it is taught. Children can be stressed just as easily playing games and with toys as they can be learning to read and write. Children can also be stressed by being prevented from exhibiting a skill for which they are ready or by teachers continuing to teach them a skill they have already mastered. Once individuals master a skill, it is impossible to ''teach'' it to them again. They will be bored and disinterested if we persist in teaching them something they already know. They learn about letters, numbers, shapes, and colors from Big Bird. They are reinforced in preschool or day care centers, and yet we continue to teach it in kindergarten at a time when they are ready and anxious to read and to write.

Granted some children have not been exposed to Big Bird or attended day care or preschool but these are the children who benefit the most from early intervention. The child who comes into first grade one year older chronologically than his classmates and is still unable to read is at a distinct disadvantage. He has been labeled as slow and that label will stay with him throughout his academic career. He may have been given the ''gift of time'' to mature emotionally, socially, and physically but cognitively he has had a year taken out of his productive life. He has experienced failure and boredom with schooling at a time when he is most eager to learn.

Yet kindergarten teachers philosophically are opposed to teaching reading in kindergartens. The philosophical assumption underlying this view is stated by Ilg and Ames (1972). They maintain that to push one aspect of development ahead of the others throws the whole organism out of balance. Therefore, the young must be taught in such a manner that balance is maintained. The aspect of development in which the individual scores the lowest ''developmental age equivalent'' is suggested to be used as the determinate of where he should be placed in school. Under these assumptions, many ''geniuses'' who have contributed significantly to the world would have been categorized ''immature'' and ''not ready'' early in their school careers.

Also, the kind of screening that is done at the kindergarten level gives us physical, social, and emotional data but it does not measure of emphasize cognitive development. Therefore, it is possible that we are allowing bright and probably gifted children to fall through the

screening net. The results of the studies back up these speculations and raise some serious questions. In one extreme case a child scored 1 and 1/2 years below his chronological age on a kindergarten screening test; in the 17th percentile on the Metropolitan Readiness Test, Level I; and was labeled by the teacher as too immature to be in kindergarten at the beginning of the school year. After he was exposed only one hour per day, only 3 to 4 days per week, for only 10 weeks to "Writing to Read," he scored in the 8th percentile on the Metropolitan Readiness Test, Level II and was reading and writing at the end of the school year. This was not magic, it was effective education.

The major policy implication of these studies can be stated in a single sentence. Students do benefit from formal reading instruction in kindergarten — especially children from disadvantaged home environments. The reading program does not have to be stressful and it can be incorporated into the regular traditional kindergarten curriculum as has been demonstrated by Zenke (1984), "Writing to Read" (Kelble and Hanson, 1985), and the SWRL-Ginn Beginning Reading Program (Hanson, Seigel, and Broach, 1986). The value of the pride and joy children experience when they learn to read and write on their own is not only that it allows them to accumulate knowledge, but more importantly, it gives us a closer look at children's communication skills early in life and enables us to meet their needs more adequately instead of allowing them to languish until we discover they are bright but have lost interest in learning. We then spend much time and money on remediation but most tragic of all is that children's gifts and talents are usually lost forever or channeled into behavior unacceptable to their culture.

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Editor's Note: For specific references, please write to the author.

Teaching Debate to Gifted 5th and 6th Graders

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The United States should not trade arms for hostages. Bernhard Goetz should not have been acquitted for the subway shootings. Jim and Tammy Faye Backker should be given back their PTL ministry. Surrogate mothers should not have visitation rights. Teachers should not be moved from their positions at the discretion of the Board of Education. Children with AIDS should not be allowed to attend public school. I could go on and on. Do these statements arouse opinions and conflict within you? Everyday, we are faced with more and more issues like these that students need to be prepared to discuss intelligently and formally and that is one of the reasons debating is so valuable for the students we teach.

Debating is common in most high schools and in many junior highs, but not often taught at a sophisticated level in the elementary school. The purpose of this discussion is to share some of the things we have learned about debating with this age student and to persuade any who haven't tried it to begin introducing debate.

Our purposes in teaching debate to children are:
1. to teach children to debate rather than to argue
2. to make children aware that every issue has two sides

3. to make children more aware of current and pertinent issues
4. to provide them with a constructive means for participating in the resolution of these issues
5. to teach high level research skills and thinking skills
6. to build students' self-confidence in speaking before an audience
7. to develop leadership skills and to promote sportsmanship

The goals are many and broad. Most of them just happen as a result of the process.

It is only logical that those persons who we expect to have their fingers on the pulse of the future need an early start in developing the skills of self-expression. Debating deals with all aspects of self-expression — listening, extemporaneous speaking, practiced speaking, research, note-taking, speech writing.

We have modified local high school debate programs for our students so that, while the mechanics are the same, they are more manageable (shorter speeches, no cross-examination, etc.). Each of the two teams, affirmative and negative, has two members. The affirmative team supports the proposition and the negative team opposes it. An example of a proposition is: Nuclear energy should be used to provide electric power in the state of _____.

There are two types of speeches: constructive and rebuttals. The speeches are given in this order.

    1 AC: First Affirmative Constructive
    1 NC: First Negative Constructive   3 minutes each
    2 AC: Second Affirmative Constructive
    2 NC: Second Negative Constructive
                Recess
    1 NR: First Negative Rebuttal
    1 AR: First Affirmative Rebuttal   1½ minutes each
    2 NR: Second Negative Rebuttal
    2 AR: Second Affirmative Rebuttal

Notice that the negative team has the advantage of two consecutive speeches in a row (2NC and 1NR), and the affirmative team has the advantage of speaking first and last. The affirmative team has this advantage because it has the task of changing the status quo.

In the consecutive speeches, the speakers develop arguments that are supported by evidence and reasoning. Here are some pointers we use to help the constructive speakers.

I. 1AC (This speech can be pre-written.)
   A.   Introduction (20-30 seconds long)
      1. Identify yourself and your team.
      2. Present the resolution with a question, a quotation, or a summary.
      3. Say, ''My partner and I support the resolution'' i.e. ''Space exploration should continue without human beings on board.''
   B.   Case
      1. Say, ''I will now present my case.''
      2. List reasons. Use evidence and examples.
   C.   Plan
      1. You may mention the plan, but it is the second affirmative's job to explain the plan.
   D.   Conclusion
      1. Summarize
      2. Have a snappy ending.
II. First Negative Constructive
   A.   Introduction
      1. Introduce yourself and your team.
      2. Say, ''My partner and I do not support this resolution (state it). We think the status quo is a much better position.''
   B.   Attack 1AC
      1. Say, ''My opponent says _____ but I disagree because _____ .''
      2. Hit every single reason that the first affirmative constructive mentions (this will be easier if you took good notes).
      3. Use evidence, examples, logic.
   C.   Case
      1. Say, ''I will now present the negative case.''
      2. List all the reasons why your team feels the way you do — use examples and evidence.
   D.   Conclusion
      1. Summarize — mention your most important reason again.
      2. Restate that the status quo is just fine.
III. Second Affirmative Constructive
   A.   Introduction
      1. Identify yourself and your team.
      2. Say, ''My partner and I support the resolution (state it).

B. Attack First Negative Constructive
   1. My opponent says _____ but _____.
C. Case
   1. You may repeat some of your partners reasons.
   2. You may introduce one or two more reasons, but save most of the time for the plan.
   3. Use evidence and examples.
   4. Start by saying, "let me review our case."
D. Plan
   1. This is your big job—spend most of your time here.
   2. Tell what you would do to achieve this resolution.
   3. Tell what steps you will need to take.
   4. Tell how you will overcome problems.
   5. Start by saying: "I shall now explain our plan."
E. Conclusion
   1. Summarize—"The status quo is not working."

IV. Second Negative Constructive
   A. Introduction
      1. Introduce yourself and your team.
      2. Say, "My partner and I do not support the resolution" (state it).
      3. We think the status quo is just fine.
   B. Attack Second Affirmative
      1. "The affirmative plan can only cause harm." Give reasons, examples, and evidence.
      2. Key words: I disagree., Where's the proof?
   C. Counter Plan
      1. You may create an alternative plan if it seems appropriate but it isn't necessary.
   D. Conclusion
      1. This is also part of your big job, spend time on it.
      2. "The main point is _____ and the affirmative team has not _____ ."

Recess: In these two minutes, look over your flow charts or notes, decide and plan with your partner which partner will attack which things and which partner will restate which things.

The rebuttals seem to be the most difficult speeches for elementary students. The children seem to feel that there is nothing left to say, but they should remember that this is their last chance to con-

vince the judge and can be the most important speech. It seems to help to write down the most important issues raised in the round, explain why they are so important and extend and clarify earlier arguments in order to show why you believe your side is winning the arguments. In summary:

V.   Rebuttals (affirmative and negative)
    A.   Can introduce new evidence but no new arguments
    B.   Summarize
        1 .Say "The major issues of this round are . . . or "My team's position satisfies these questions."
        2. Show how your side supports these issues.
    C.   Persuade
        1. Use evidence and examples to persuade.
    D.   Attack
        1. Make sure all the opponents' arguments have been shot down.

We have discovered other trouble spots that tend to recur such as getting students to listen *and* respond to the other side. It seems much safer, but far less effective, to prepare a speech ahead of time regardless of what the other team says. Another struggle is in getting children to cite their evidence and, in a related problem, keeping their evidence organized.

We have had several small or regional competitions per year with an annual district — wide final competition. The debates are judged on support of proposition, structure, delivery, and refutation. The highest scoring team wins the round. Certificates and trophies are awarded. Our judges have included high school debaters, parents who were former debaters, college debaters, present and former gifted and talented teachers, and community members. While these volunteers have been hard to find, their participation has been of extreme value and highest quality. The competitions also provide a means for interacting with students from other schools, as well as for teaching and learning good social skills.

Here are some other things we have learned.

1. Start slowly — make sure students learn one concept before moving on to the next. In other words, one must be comfortable with giving an introduction before writing a plan.

2. Help the students in the research process (find articles, provide speakers, etc.). Students can get bogged down in research to the point where they never get around to writing a speech.

3. Make it optional. Some students get really excited but others get really turned off or stressed.

4. Evaluate each other with immediate feedback. Videotaping is very helpful for this purpose.

5. Provide opportunity for lots of practice in front of the group (and in front of mirrors).

6. Use parents as resource persons or organizers or as an audience. Also be sure to let parents know what issues you are debating ahead of time.

7. Invite the local media to your competitions. It is a great avenue for publicity for your program.

Once they start debating, choose topics in which the students are interested and care about, as well as those that can be easily researched. If you need a few more topic ideas, try these: Socialized medicine, fixed retirement age, lenient education for athletes, 12 month school year, capital punishment, illegal alien employment, drunk driving laws, smoking laws, school prayer, video arcade limitation to youths, and cable TV censorship.

In this exciting world there is no dearth of timely topics. Your only limitations are your imagination and your discretion. While it is fine to begin with less wordly topics such as "the blue shoes are better than the red ones," it is essential to move quickly to important issues that students are and will be facing in their lives.

If this discussion has not sparked your interest, trying it out certainly should convince you. Help us give our gifted and talented youth as many skills as possible for dealing with difficult issues and problems in their futures — and ours.

Word Magic: Shakespeare's Rhetoric for Gifted Students

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Gifted students need effective language tools. *Rhetoric* is a literary discipline that deals with all the details of language with the chief objective of stimulating effective oral and written communication. This paper advocates the use of a particular curriculum (grades 4-12) entitled *Word Magic: Shakespeare's Rhetoric for Gifted Students* (Creative Education-SOI, P.O. Box 572, Pacific Grove, CA 93950). All play excerpts are taken from the *Folger Library General Reader's Shakespeare*.

Specifically, rhetorical devices are tools for emphasis and lexical congruence or incongruence which give writing and speech appropriate emphasis, fabric, and tone. For instance, in the following excerpt, (AYLI, V, ii, 85-87 and 90-92, pp. 93-94), Shakespeare uses (1) *parison*: "word correspondence within adjacent clauses" (Kester, p. 46) and (2) *anaphora*: "the repetition of the same words at the beginning of a sequence of clauses" (Kester, p. 20) — to heighten the comic effect:

Phebe:	And I for Ganymede. (L. 85)
Orlando:	And I for Rosalind.
Rosaland:	And I for no woman.

and later:

Phebe: And I for Ganymede. (L. 90)
Orlando: And I for Rosalind.
Rosalind: And I for no woman.

When studying Shakespeare's rhetorical devices, students love to "detect" his "tricks" and make them their own. These "sleuthing activities"—in *Word Magic*—quickly reveal Shakespeare's grasp and application of the "right tool" in the "right place," a superb *model* for their own emerging creative efforts. *Word Magic* is a 194-page textbook in which 70-plus rhetorical devices are illustrated in context. The exercises enable students to understand not only *what* these tools are, but also *how* and *why* they are effective. These excerpts are taken from the six comedies: A Midsummer Night's Dream, Twelfth Night, The Tempest, The Comedy of Errors, The Taming of the Shrew, and As You Like it.

Why Shakespearean rhetoric? One explanation is that it offers the right kind of challenge. Far too frequently the classroom activities for gifted, creative, and talented students (G/C/T) are too ordinary and non-stretching to enrich, or even to engage, the high-voltage capabilities and energies of these students. The quotation below captures the use of much current research regrading the needs of the highly capable students (Smith, p. 76):

> Creative children like to attempt challenging, difficult and dangerous tasks; they strive to bring order out of disorder, sense out of chaos; they seek for a purpose.

Paradoxically, significant support for dynamic *language arts programs* for gifted students comes from the "high-tech" people. John Naisbitt, author of *Megatrends* (p. 45) emphasizes the importance of the humanities curriculum and states that:

> As computers begin to take over some of the basics of education, schools will be more and more called upon to take the responsibility for teaching values and motivation, if not religion . . . the need for compensatory high-touch is everywhere. The more high-tech in our society, the more we will want to create high-touch environments, with soft edges balancing the hard edges of technology.

Support for the highly intellectual challenge of Shakespeare is apparent in various definitions of giftedness. James Gallagher, one of

the key "gurus" in the field of gifted education, states (Gallagher, p. 19):

> The one factor that youngsters labeled "gifted" have in common is the ability to absorb abstract concepts, to organize them more effectively, and to apply them more appropriately than does the average youngster.

Word Magic is a "participatory" or "hands-on" curriculum. In addition to sequential "lessons" that facilitate literary study, *Word Magic* includes an "Audition Scoreboard" and a "Performance Scoreboard" or *criteria* by which teachers and students can implement and evaluate their work. A *Rehearsal Schedule* is provided in the framework of the creative process: Preparation, Concentration, Incubation, Illumination, and Elaboration (Kester, p. 180). The individual and group activities offer "high-touch" learning experiences that combine intellectual/imaginative projects with demanding social situations.

Word Magic enables the teacher to avoid an all-to-attractive "trap" — paraphrasing — or the tendency to shortchange Shakespeare's language. Paul Whitworth, a member of the Royal Shakespeare Company who performs and teaches each summer in the Shakespeare Festival at the University of California, Santa Cruz, warns classroom "directors" as well as professionals (Whitworth, 1984):

> Whenever a production of Shakespeare fails, quite likely it does so because, in their preparation, the actors content themselves with a mere *paraphrasing* of the lines.

Mr. Whitworth emphasizes the "necessity of the text" when he points out that actors of whatever age need to know what Shakespeare is *actually* saying—not what they think he is saying—and they need to know *how* he says it. Knowing Shakespeare's rhetorical devices is the way to avoid the "paraphrasing" trap. Six of the twelve *objectives* of the *Word Magic* curriculum state that students will (Kester, p. 2):

1. Exercise and sharpen their cognitive abilities.
2. Learn the components of drama (setting, characterization, plot, exposition, foreshadowing, suspense, dialogue, theme, etc.)
3. Grow in self and social awareness.
4. Develop an appreciation of *Art*.

5. Extend their sensitivity to, and facility with, language (oral and written).

6. Discover and cultivate a number of creative abilities.

The "pay off" is cumulative, making their study informed, and, therefore, purposeful, and their productions intelligent, and, therefore, dynamic. A significant discovery the students make is described by Styan (p. 147):

> The tone of speech and the function of character are inseparable, for Shakespeare is also capturing in sound and rhythm, the dance of the individual mind.

The following two examples from *Word Magic* will illustrate that the knowledge of rhetorical devices is not only a mnemonic strategy, buy also the key vehicle for accurate interpretation and powerful performance.

Example #1: *Comedy of Errors* (I, ii, 85-8, p. 10)

(L. 85)   S. Ant.: Where is the thousand *marks* thou hadst of me?

E. Drom.: I have some *marks* of yours upon my pate,
Some of my mistress' *marks* upon my shoulders,

(L. 88)   But not a thousand *marks* between you both.

Here Shakespeare uses the device called *antanaclasis* meaning "shifting repetition" when he *shifts* the meaning of the word "marks" from *money* (lines 85 and 88) to *wounds* (lines 86 and 87). the playwright's *purpose* is to increase the confusion, and, thus, the comic effect (Kester, p. 21). As two boys prepare to perform this scene, knowledge of this device will motivate them to *emphasize* those key words. In so doing they will grasp and convey the comedy of confusion which is Shakespeare's intent.

Example #2: *As You Like It* (IV, II, 197-200, pp. 78-9)

Ros.: O coz, coz, coz, my pretty little coz, that thou didst know how many fathoms deep I am in love! But it cannot be sounded. My affection hath an unknown bottom, like the Bay of Portugal.

Here Rosalind is explaining to her cousin, Celia, how deeply she is in love with Orlando. Students will quickly spot the *simile* "like the Bay of Portugal: an the implied *metaphor*; i.e., a deep love = the deep ocean. Another key rhetorical tool is *hyperbole*, the Greek word for "excess" (Kester, p. 39). Shakespeare employs it to convey the

"excessive" state of Rosalind's emotions at the moment; i.e., "how many fathoms deep," "cannot be sounded," and "unknown bottom."

Epizeuxis is the device Shakespeare is using when he repeats the word "coz". *Epizeuxis*, the Greek word meaning "a fastening together," is the exact tool Shakespeare needs to convey Rosalind's breathless excitement. Her speech builds to its main point: her intense love for Orlando. Thus, coupled with the device of *hyperbole*, the tool *epizeuxis* enables Shakespeare to dramatize one of his key themes in AYLI—the extravagance of young love—and, with these rhetorical devices, the playwright dictates how the speech is to be rendered.

The *Word Magic* of Shakespeare will affect students academically, artistically, and morally. And a bonus—a serendipitous effect of this rhetoric-focused curriculum—will be the dynamic classroom in which students experience both the challenge and the rewards of being G/C/T students.

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Diversity of
Gifted Programs

A Follow-up Profile of Potentially Gifted Children Grown Into Adults

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The seven young people with whom I have chosen to begin this follow-up study (four females and three males) were not selected initially on the basis of intellectual superiority. The truth is, I first met each of them at different times as grade schoolers or pre-schoolers participating in my annual creative writing workshop called "The Children's Festival of Words." They have been sent to the CFW as representatives of their schools and had been recommended by their school administrators and/or teachers on the basis of their imaginative facility with the written word.

Fortunately, I had decided to have each CFW batch of young writers undergo a variety of standardized tests: mental ability, reading, creativity, emotions and personality profiles, and so on. I had also had each participant's parents answer a questionnaire outlining the family background and their observations of their child. Also I had kept careful record of all these over the years since the first CFW workshop in 1973. Little did I realize that all the data would someday form the basis for a study on individual gifted Filipino children.

The fact that these children had more to them than mere writing ability was evident to me from the outset. But as I maintained close communication with them, as they entered adolescence and even

early adulthood for some, and as I kept in touch with their parents as well, I became witness to the unfolding and flourishing of their potentials. Although all of them have encountered disappointments, misunderstandings, and difficulties in relation to their growing up as gifted youngsters, they have also all had accomplishments which they can be proud of. And they have generously shared both sides of themselves with me and with their fellow-members in TAG (Talented and Gifted) - Philippines, an organization of gifted young people which I organized in 1983.

The personal histories of these seven young Filipinos: their family backgrounds, upbringing, achievements, test results, as well as their views, attitudes and feelings now comprise the modest beginnings of this first-ever case study of gifted young people in the Philippines.

General Observations

As mentioned, initial screening of participants in the Children's Festival of Words workshops was done on the basis of recommendations by their school administrators and/or teachers. Formal standardized tests were then administered to the children during the workshop itself, *after* they had been accepted.

Upon examination of the results of those tests, however, it became evident that these children who had been recommended primarily on the basis of their writing skills and their observed classroom performance also possessed above-average to superior intellectual ability (as indicated by their IQ scores) and exhibited marked talents in areas other than writing ability: academic performance, leadership, the creative arts, the performing arts, music, the sciences, mathematics, etc.

This diversity of talent was particularly evident in the case of the seven children who are the initial subjects of this case study.

In an attempt to assess the abilities of these seven young people in comparison to those of their peers in the various CFW workshops, I extracted the test results of the four CFW batches to whom a complete battery of mental capacity, reading, creativity, emotions and personality tests had been administered. I then compared these results with the individual test scores of these seven. In all seven cases, I found that these youngsters were indeed multi-gifted—in five of the cases, quite markedly so. (Note: the tables and graphs of the pertinent test results are omitted here for purposes of brevity, but are available upon request.)

Summary of Individual Profiles

What follows is a brief discussion of the significant details of each of the seven subjects' personal histories and test results on record. For our purposes, I have chosen to simply use each child's first name in referring to his or her data.

I must also point out that the small size of the sampling inhibits me from drawing general conclusions from the data regarding the Filipino gifted child. However, I feel that the close contact and observation that I have been able to maintain with each of these young people from early childhood through adolescence and early adulthood lends unique value to this as a more in-depth personal profile, rather than a mere statistical listing.

A. *Family Background*

In terms of parents' occupations, five out of the seven subjects had fathers who were in the professions (2 in law, 1 each in medicine, business, and engineering) while one had a father in public service (a policeman) and the other's father was deceased.

Similarly, five had mothers who were housewives while the remaining two had mothers in the professions (medicine and psychology). Significantly, though, I have learned from personal observation over the years that three of the mothers—regardless of their stated occupation—who took it upon themselves to directly intervene in their children's development are those whose children have become obvious achievers in a wide range of fields all at the same time. The advantages and disadvantages of this type of parental intervention still need to be looked into and could, in fact, form the basis for a separate study altogether. However, I believe it is an observation worth noting even at this early phase of this study.

In terms of family size and the subjects' position in the family, these factors did not seem conclusively relevant to these children's special abilities. Not counting their parents, the subjects belonged to families ranging from one to five members and they held positions from the eldest, second, third, to the youngest in the family, while one was an only child. It may be significant to note, however, that the three super-achievers mentioned above were either the eldest in their families or an only child.

B. *Description by Parents*

Three boys who were subjects, Raymund, Prudencio and Jay, were described by their parents as being very capable and conscientious students even as very young children, with simultaneous in-

terests in reading, mathematics, science and the arts. However, they did not note anything that would set them apart as "gifted." All three boys were apparently the quiet type, keeping mostly to themselves, although they also excelled academically from their earliest school years, being consistently on the honor roll.

One of the girls, Deanna, was initially thought to be merely an average learner until her difficulties were traced to a vision problem. Once this was corrected, however, Deanna shone consistently in nearly every area of schoolwork, particularly language arts and literature. And her parents maintained an attitude of quiet encouragement and support throughout her childhood and teen years.

The other three girls, Lourdes, Lea and Patricia, are the apparent "super-achievers." Not surprisingly, their parents' (actually their mothers') descriptions of them as young children picture them as early walkers, early talkers, early readers, early performers, early artists. All three were reported as being clearly exceptional in many ways and their parents were very eager to develop that exceptionality. It would be interesting to investigate whether it was these children's natural precociousness that sparked such parental enthusiasm, or whether it was the parents' urging that brought on these children's drive to achieve and excel.

C. *Test Results*

The five children who underwent mental capacity testing during the Children's Festival of Words workshop all registered IQs above 120: Raymund 129 at age 7, Lourdes 134 at age 5, Prudencio 122 at age 10, Jay 122 at age 7, and Lea 135 at age 6. Unfortunately, Deanna and Patricia participated in the "maiden" workshop of the CFW in 1973 when the format was much more free-wheeling and standardized tests were not administered. However, their subsequent achievements have more than attested to their superior capabilities in very diverse fields.

In the Torrance Figural Test of Creativity which Raymund, Lourdes, Jay and Lea took, also during the workshop, all four were judged as being highly original and innovative in their ideas. Additional observations made by the evaluators were Raymund's and Lea's concern with being detailed, exact and "straight to the point" in expressing their ideas, and Jay's being "verbally inclined" despite the figural orientation of the test. It must be remembered that the age range of these children was from 5 to 7 years old at the time.

In the years following their participation in the CFW workshops, these seven children along with many other CFW alumni were requested to keep me informed of their current school progress and activities, their interests and hobbies, their achievements, as well as any difficulties they may have been encountering in school or at home. Part of this follow-up was in the form of questionnaires, surveys, personal interviews whenever possible, and standardized testing. My intention was to try to spot those areas of initial superior ability or exceptionality which had either been enriched or diminished over the years, and to try discern the reasons for such enrichment or diminishing.

The Gates-McGinitie Reading Test was one of the standardized tests administered as part of that follow-up. Since each of these children had originally come to the CFW workshop on the strength of their writing skills, I presumed that reading proficiency would be another of their strengths. It turned out that all four children in this sampling of seven who took the reading test, had Vocabulary Levels which were 3 to 5 levels above their actual grade in school and Comprehension Levels which were 3 to 6 levels above their actual grade in school.

Another follow-up test which was administered to four of these seven subjects was the Wide Range Intelligence-Personality Test (WRIPT). Again, all their Intelligence Scores were above 120 but, significantly, the correlated Capacity Score of each one was at least 20 points above that. In one case, it was even 42 points above the Intelligence Score. I point this out because the WRIPT manual itself states that "A difference of 12 or more points between the Intelligence Score and the Capacity Score may be considered significant. A large discrepancy between the Intelligence Score and the Capacity Score is always indicative of adjustment problems. (Although a small discrepancy does not necessarily indicate absence of behavior and learning problems.)"

Looking at the Intelligence Scores/Capacity Scores of the other CFW alumni tested, I made the further observation that the higher the child's Intelligence Score (130 and above, for example), the greater the discrepancy between this score and his or her Capacity Score. This could raise the question, then, that greater mental ability could possibly bring with it some adjustment problems owing to the child's greater sensitivity and deeper level of perception. However,

this would of course require further study before any conclusion can be drawn.

Aside from the WRIPT, four of our subjects in this study were given personality/emotions profile tests. In the Gordon Personal Profile/Inventory which three of them took, the results do not yield any definite pattern—which is probably to be expected of a test meant to define the subject's unique personality traits. The variations could also have been due to the different ages of the subjects and the different stages they were in in terms of their personal development.

However, two very clear similarities which emerged among all three profiles were (1) an extremely high sense of Responsibility and (2) a noticeably low level of Sociability and Personal Relations. Two of the subjects also had an extremely high level of Original Thinking, in keeping with their intellectual capacity. However, none of them exhibited a "take-charge" attitude in their Ascendancy scores.

The one other subject who was given the Emotions Profile Index obtained an extremely high score in his "trustful" trait and a very low score in his "controlled" trait. All other traits resulted in average scores, except the "gregarious" trait in which he registered a higher than average score.

Assessing the test results now available for this profile study, it is clear that, in the future, uniform testing must be administered to all subjects in the study to allow for conclusive evaluation of them as individual gifted children and as representatives of Filipino gifted youth as a whole.

D. Self-Description

In the course of the follow-up evaluation done for each of our subjects, they were repeatedly requested to share with me, either in writing or in a personal interview, their views of themselves, of being gifted in some way, of their parents' role in their development, of current issues, of the future and so on. Unfortunately, space limitations keep me from being able to share these views at length.

However, the general impression I have gotten from these young people is that they are aware of and quite proud of their exceptional abilities — even if they may not be too comfortable with the label "gifted." In fact, they have extended and built upon their parents' initial recognition and encouragement of their gifts and a number of them have accumulated a list of truly impressive accomplishments.

They have admitted the limitations of our present educational system to adequately meet the needs of our nation's gifted. Two had

been temporarily discouraged by this lack, but the rest had forged ahead in spite of it.

But there are two even more significant revelations within these seven profiles. The first is that possessing multiple talents does not seem to be a burden to our gifted young people: they shine almost equally in areas as diverse as academics, the visual arts, the performing arts, music, the sciences, mathematics, language arts, public service leadership, business, and sports. In fact, they seem to revel in this challenging variety, almost as though one area spurs them on to do well in the others.

The second significant revelation is that, despite their exceptional gifts, these young people have remained refreshingly—and inspiringly—unselfish. This may seem to run counter to the findings of many studies on gifted young people which picture them as "loners" or as too impatient with the less able, preferring to keep to themselves rather than mix with those who cannot keep up intellectually. These seven subjects of our profile study have proven that making *a conscious choice to put one's gifts at the service of one's fellowman* is certainly within their realm. In fact, their very lives thus far as young adults are already attesting to this commitment that they have made.

This is a touching tribute indeed to the parents and educators who have put so much into the formation of these young gifted minds. But it is equally a heartening sign to a nation in crisis, such as ours is, to see exceptional ability being so generously offered for our benefit.

Future Plans

These profiles of seven gifted young Filipinos comprise only the seed of a larger plan to extend and expand this study in the future. I intend to continually add new profiles of gifted children whom I encounter and who signify their willingness, along with their parents, to participate in such a long-term study.

As the store of data continues to grow, I intend to conduct more and more comprehensive and in-depth evaluations to try to discern the true nature, needs, concerns, problems and possibilities of the Filipino gifted child. Also I want eventually to arrive at, and hopefully publish, more conclusive findings on this topic as a guide for concrete plans (at the individual, home, school, community, and national level) on the development and nurturing of such exceptional children.

Goals, Methods and First Results from the Munich Longitudinal Study of Giftedness in West Germany

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The Budesministerium fur Bildung and Wissenschaft in Bonn (BMBW, Federal Ministry for Education and Science) has been supporting an educational psychological research project with the title "Forms of Giftedness in Children and Adolescents: Identification, Development and Performance Analysis" has been carried out since 1985 at the Ludwig-Maximilians University in Munich and is planned for a period of several years. The following goals have been set to date:

(1) The question of whether it makes more sense to speak of domain-specific talents or from general giftedness is to be examined. In the past, "giftedness" and "high intelligence" were namely often used to indicate the same thing. Now, the postulate is represented here that there are various forms of giftedness: among others, intellectual, creative, social, psychomotor-practical and musical giftedness.

(2) As far as it should be possible to determine different forms of giftedness, a comprehensive multidimensional psychodiagnostic test battery is to be developed which should make the identification of highly gifted students in the areas described above. This means that questionnaires and test scales are to

be developed and tried out with which children and adoles-
cents from the age of 6 to 16 years can be tested to determine
whether they are intellectually and/or creatively gifted,
psychomotorically gifted etc. Furthermore, it is interesting to
determine whether these children and adolescents are gifted in
single domains (so-called singularly or one-sided gifted) or are
gifted in all domains (so-called multiple or many-sided
gifted). Measurement instruments of this type are necessary
before educational measures especially for the gifted can be
realized.

(3) If one views "giftedness" as a specific ability profile or a per-
son which can be measured with tests and questionnaires,
then it must be determined under which circumstances these
abilities result in outstanding performances. Someone who is
highly intelligent, does not automatically have good grades;
there are also highly intelligent failures in school. Thus, one
should determine which other personality characteristics (i.e.,
technical interest, success orientation, perseverance, learning
strategies) and which qualities of the environment (i.e.,
achievement orientation in the family, relationships with
teachers and other students) effect the achievement level.
Recognitions of this nature are useful for the psychological
counseling of the gifted and their parents.

(4) Gifted children and adolescents change during the course of
their development. Talents can disappear when they are not
nurtured, new interests can be stabilized given the right stimu-
lation. The observation of the development of gifted children
(and a control group of normally gifted children) is the fourth
goal of the Munich Giftedness Project.

In order to achieve the four goals named, during 1986, several thou-
sand children and adolescents have completed a comprehensive test
battery. First, teachers of various types of schools (at six different
grade levels) were requested to make a rough estimation of their stu-
dents talents. Based on these estimations/ratings, 1000 students were
selected per grade level who were considered particularly good in one
or more of the following giftedness domains: intelligence, creativity,
social abilities, psychomotor-practical abilities, music. These 6000
students were tested regarding their abilities and questioned about
their achievements. Additional information was received from the
teachers and parents of these students. The participation was volun-

tary for all involved and was carried out anonymously. Early in 1987 all of the students tested were given a report about their results in a sealed envelope.

Using the data collected, the following questions could be answered: (1) whether the five factors of giftedness named represent individual giftedness dimensions or not, (2) whether highly gifted students could be found in each of the giftedness areas and (3) whether the instruments used are appropriate for the identification of the gifted.

Before the previously collected information is presented in detail, the procedures will be presented with regard to time and organization. Beginning in early 1987 a group of highly gifted students was determined for each age level. This group was matched by a group of so-called moderately gifted. In addition, students were also selected who only showed moderate values in the giftedness dimensions but were particularly good in their academic and non-academic achievements. These students were the basis sample of the further testing which is being carried out from April to July (2000 students from grades 1 to 9) and from September to October 1987 (400 students from grade 11). The study includes approximately 150 schools in the federal states Bavaria, Baden-Wurttemburg and Berlin.

Aspects of development as well as the role of characteristics influencing achievement are especially emphasized in this research. In 1988 the tests are to be repeated with the same students in order to follow the development of the highly and moderately gifted longitudinally.

The research project described here is now in its second phase (of the longitudinal study). Whereas during the first phase, the emphasis was more on the development of measurement instruments for identifying the gifted, the second phase concentrates more on the development of giftedness, personality and achievement in students. From 1988 on, the approach is to be supplemented by a third phase; the cognitive processes and problem solving strategies of the gifted as compared with the normally gifted are to receive more attention. The application of new testing methods with a computer basis is in preparation. Interesting results are expected from such tests which, in contrast to previously employed methods, are supposed to determine complex thought processes and their development.

Due to the comprehensive sets of data, the interpretation work is still in progress. In the following, the results which are presently available are to be summarized:

(1) The five factors considered, intelligence, creativity, social competence, psychomotor abilities and musical talent were proven to be independent and individual dimensions of giftedness. Thus, the prerequisite for speaking of domain-specific giftedness has been established, i.e., that there is not only one single form of giftedness, but rather many forms of giftedness. When one takes a closer look — based on the diverse tests of giftedness which were employed — additional dimensions of giftedness were determined, e.g., the speed of reaction and spatial thinking.

(2) The instruments employed exhibit the desirable precision even at extreme levels of giftedness. Thus the goal of establishing reliable tests was reached. A good strategy was found to be presenting the gifted students with test items normally used for much older students. Since highly gifted students are frequently many years advanced in their intellectual development as compared with their peers, they are thus met with items of appropriate difficulty.

(3) If one designates the very best in each of the giftedness dimensions found as "highly gifted", then one finds clear differences between the highly gifted and the normally gifted (in each of the domains of giftedness) and, on the other hand, between each of the types of giftedness. These differences are, above all, found in the achievement characteristics. For example, the especially gifted in the area of intelligence are characterized by their particularly good grades; they are not only better than the normally gifted, but also better than the creative gifted, the social gifted, etc. In contrast, the creative gifted are much better than all of the other types of giftedness in creative achievements, e.g., in artistic and literary areas. Each of the groups of gifted, therefore has its achievement emphasis. This means, practically speaking, that when looking for students who are capable of outstanding achievements, must also take domain-specific talents into consideration. It is not enough to rely only on a general intelligence test, based on the (false) assumption that all highly intelligent students will be found.

(4) Students are seldom found who could be considered highly gifted in several giftedness domains. Multiple talents (many-sided gifted) or all around geniuses are more an exception than the rule. Therefore, highly gifted students should also be

supported in individual areas. If one looks at the students who are both highly intelligent and creative, and compares them with students who are either highly gifted or highly creative, then one sees that those who are gifted in both areas are much better than all others. As seldom as multiple giftedness is, it has extremely beneficial effects. Therefore, the diagnosis of the highly gifted should always proceed in a multi-dimensional way.

(5)   If one views various achievement domains instead of giftedness itself, and examines which characteristics that differentiate the outstanding students (in the various areas) from the other students, one makes an interesting discovery: the particularly capable students can be differentiated through their achievement orientation, perseverance, willingness to exert themselves, interest in new information, research motivation, inventiveness and success orientation. These motivational characteristics seem to play a greater part than pure ability characteristics. Certainly one has to limit this statement: Achievements were examined which could be made by many students if they exerted themselves adequately. When viewing outstanding intellectual achievements, the importance of the giftedness is probably much more important. Based on this observation, one could conclude that giftedness is an important prerequisite for outstanding achievements, however, a central role is played by achievement motivation and interests which must be encouraged and supported by teachers and parents. This concurs with the research results from Renzulli et al.

(6)   If one researches the question of how the highly gifted are distributed among the various types of schools (Hauptschule, Realschule and Gymnasium), one sees that the highly intelligent students almost all attend Gymnasium. In contrast, one finds relatively many creatively and socially talented students in the Hauptschule. Since the Realschule also provides a meaningful quota of highly gifted students, giftedness programs should not be limited to Gymnasium.

(7)   Since the support of the highly gifted is generally postulated as a task for educators, the question must be raised of which characteristics are found in students that teachers nominate as highly gifted. Generally only a moderate correlation is found between test data and teacher nominations. One can demonstrate that teachers generally rely heavily on school perfor-

mance in making their evaluations. Since teachers often have limited contact with their students within the academic setting, they can hardly be expected to provide differentiated evaluations of giftedness. They sometimes tend to rate a student as gifted in all areas although he/she is only outstanding in one area. On the other hand, they are more likely to overlook single talents. If one gives teachers the task of selecting highly gifted students, one needs to take these tendencies into consideration and possibly correct them. Certainly one needs to take into consideration that the teachers in the study presented here made their nominations without any practical consequences. If, on the other hand, they are requested to make selections for courses which are to be carried out, they select quite qualified students.

The data from the coming research should provide further information about the quality of teacher nominations, the conditions for outstanding achievements, and the usefulness of the giftedness test instruments. This information is necessary before practical recommendations for the identification, education and nurturance of highly gifted students can be made.

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Themes From "Girls, Women, and Giftedness"

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"Girls, Women, and Giftedness: An International Symposium" took place May 25-27, 1987, at The University of Lethbridge in Alberta, Canada. Prominent among the 50 presenters were: Carolyn Callahan, Shelagh Gallagher, Christine Garrison, Esther Gelcer, Sandra Gilbert, Susan Gubar, Barbara Kerr, Margaret Lipp, Norah Maier, Angeline Martel, Kate Noble, Sally Reis, Linda Silverman, and Karen Verbeke. On the third day of the symposium, round table discussions were held on the topics of "Issues at the Intersection of Gender and Giftedness" and "Directions for Research and Program Development." This paper, developed from an analysis of the transcripts of the two round table discussions, represents an attempt to concisely summarize their contents.

Issues at the Intersection of Gender and Giftedness

Identification of Gifted Girls

Early identification, between the ages of four and six, is of particular importance for gifted girls. Thereafter, they are prone to engaging in classroom or test-taking behaviors which hide their abilities. There is resistance to the idea of excluding anyone but high IQ children from gifted programs (children with IQ's of 118 can match the creative productivity of children with IQ's of 135), but at the same time, a social emphasis on production or achievement as a measure of giftedness can serve to convince underachieving gifted girls that they are not gifted. Boys, more so than girls, will respond to pressure to produce and achieve as a means for showing or "earning" their giftedness. While new measures of giftedness which give credence to women's experiences are required, IQ tests in the meantime, used as early as possible, can help find gifted girls. Where early IQ scores do not predict to later academic achievement, one also has to consider the influence of an anti-intellectual society, dull or unchallenging classrooms, and lack of guidance.

Feminine vs. Masculine Characteristics

Many characteristics referred to as feminine characteristics are just basically good human characteristics: caring, concern, responsibility. We also wish to develop "good male characteristics" in females: achievement, motivation, risk-taking, independence. We want to expand development for both females and males in all of these strength areas. Very importantly, we want to expand the current concept of giftedness to include the "feminine" traits in the interests of the survival of our planet.

The assignment of gender to types of achievement is seen as a mistake and as harmful to women. That is, if competitive, goal-oriented, tangible achievement is seen to be male and cooperative, relationship-oriented, intangible achievement is seen to be female, the separate spheres argument will be used against women. If women are seen to be nurturant, caring, and involved in relationships, that is an excuse for not expecting them to be concerned with action, justice, and social responsibility on an abstract level. Further, those women who are competitive and achievement-oriented can be discriminated

against if they appear to lack the warmth and caring stereotypically associated with females.

The separate spheres of achievement argument also does not make sense when there is a power difference from the very beginning. What is desired is to have men become more nurturant and caring and women to become more action-oriented and socially and intellectually responsible. These are all human traits that will help us survive and strive for a better world.

Competitiveness and Winning vs. Supportive Cooperation

Do women need to learn to love to win? Do women need to learn to reinterpret "competition" as "doing one's personal best" (striving, persisting, not giving up) while supporting others in doing their personal best? Can we balance competitiveness and cooperation? For the most part, females seem to be competing to come in last—lowering their IQ scores and aspirations, and attributing their success to luck or chance.

As an immediate or short term concern, it appears that in our competitively structured society girls need to be taught to be competitive if they are to enter the public sphere through post-secondary education, jobs, and promotions. The strengths and skills of cooperation should continue to be nurtured however. In the long term, women do not just want a piece of the pie, they want to change the pie. Instead of changing the kinds of players they are, they want to change the game with all of its rules, structures, and systems. The countryside is patriarchal and when we say "let's compete with men" we are tacitly accepting patriarchy. We have to look at the system as it is and not constantly buy into it as it is. Women want equal access to opportunities and equal input to the mind set or vision of the world that shapes society. In the meantime, there is constant tension between surviving with the current reality and pushing whenever we can towards a new reality that we have to create. We can't afford to prepare girls for a world that does not yet exist, but at the same time we have to prepare them to create that world.

Women, Influential Positions, and Childcare

If women are to bring an alternate vision to society and its institutions, they must assume positions of influence. Women with young families are often hindered. At this time and place in history, men do

not generally assume equal responsibilities as caregivers so that women can achieve without guilt. Some spouses are restructuring childcare responsibilities so that women can accept higher level administrative positions. Some women are restructuring work pattern expectations (evening meetings instead of 3:30 meetings) so that they can participate in both spheres. And some women are requesting and getting institutional childcare help (daycare at the workplace). For other women, however, "being there" for their young children is a personal decision or priority that blocks them from accepting or applying for influential leadership positions.

Are children a consuming creative project for women? Can women have different timetables for public sphere productivity? Certainly there are no guarantees when either children or careers are postponed.

Power, Patriarchy, and Technology

In our patriarchal system, power is organized hierarchically rather than as a web of interconnecting strands or as a circle that is in continual flow. Achievement is equated with reaching the tops of hierarchy structures. Being competitive represents "buying into" this system and all that it represents. Some women's resistance to competitiveness and striving for power positions reflects rejection of this domination-oriented and power-laden view of the world.

Math, science, and now computer knowledge are the great levelers that screen women for post-secondary opportunities. Yet gifted girls continue to avoid advanced studies in these areas. Does this avoidance represent resistance to the war-making, domination-oriented technology of men? But technology is a good thing; it has potential to improve life. We can have students competing to improve society. The current powers over technology, however (multinationals and politicians), have not exemplified values which women can support.

Knowledge of history is seen as essential for empowerment. Women working in plants in Mexico or the Philippines don't have power when they don't have knowledge of the history of unions. We may need to encourage gifted girls to maintain strengths in math and science in order to remain viable actors in the public sphere in the current system. It may be knowledge of history, however, that will empower them to create a new vision.

Directions for Research and Program Development

Characteristics of Gifted Females

Research which claims to identify characteristics of gifted females should carefully define the population sampled. Whether research is based on females identified by intelligence tests, adult eminence, self-identification by adults, or Renzulli's "Three-Ring" definition should be made very clear.

Three questions about characteristics of gifted females are of considerable interest at this time. How are women who developed their gifts different from those with high potentialities who did not? What in fact is the life cycle of the gifted female; or, are there identifiable "seasons". Knowledge of such patterns, if they exist, can help gifted women understand their own experience and provide insights for program development for gifted girls. A third question is concerned with finding ways to identify women, particulary from minorities or less privileged backgrounds, who were "missed" as being recognized as gifted during school years.

In the long term, research on the characteristics of gifted females will require new measures of both giftedness and other general characteristics—measures which are not based on male concepts of personality or male development models or data. This work will entail exploration of models of female development. Research by Gilligan and by Belenky, Clinchy, Goldberger and Tarule provide rich starting points. Much replication work is required before generalizations can be suggested from their researches. In conducting research which investigates models of female development, it would be particularly important to include gifted female subjects and to note whether and how they differed from the general population of females.

It is expected that research on the characteristics of gifted females or on the effects of interventions, if quantitative, will require complex models (path analysis, multiple regression), and if qualitative, will have to be very well done. The current quest is for an approach that can adequately research women's or girls' experience and that can generate knowledge that brings rational, objective knowledge together with artistic, emotional, subjective knowledge.

Program Development

To a large extent, directions for program development for gifted girls are blurry until we know more about gifted females and what

their characteristics and needs are at various developmental stages. Given the rate at which gifted girls are dropping out of programs which are based on a highly competitive, logical, positivistic model, we can conclude that many current programs are not adequate. Even at this time, there are a number of things we know about gifted girls that can provide ideas for program content and design.

1. Early identification, between the ages of four and six, is critical.

2. Early programs starting in grade one are important. These should compact curriculum and provide for challenge in strength areas. When gifted girls never have to strive or persist, they come to believe that having to "try hard" with difficult material means that you don't have ability. Unisex science classes with female instructors in primary grades increase the likelihood of girls electing to take advanced science and math classes later.

3. Specific efforts are required to undo sexual sterotyping beginning in grade one. At the age of five, stereotypes are already in place. From the ages of three to ten, girls are socialized into seeing themselves as second class citizens.

4. Girls' readiness for new learning should be the guide for instruction. Current curricula are based on the model of male development. Consequently, in elementary school, girls learn to lay back and not respond as the attention goes to those who have difficulty or who are genuinely challenged by the introduction of new material.

5. In testing for mathematics achievement, time limits should be removed for girls. They are less inclined than boys to take risks or to guess.

6. If it appears that acceleration is likely going to be appropriate for a gifted girl, it should take place before the age of eight. Between the ages of 8 and 16, the gifted girl is unlikely to be willing to leave her friends.

7. Programs for parents of gifted female preschoolers or infants are important. There are a great many things that parents can do or refrain from doing to better nurture the development of girls.

8. Programs or interventions for gifted girls can usefully focus upon key decision times for gifted girls. These are at least: end of elementary school; end of junior high school; end of senior high school; and second year of post-secondary.

Finally, programs are needed for gifted women who wish to return to the public sphere after several years of emphasis on caregiving in their families.

Evaluating Instruction for Academically Gifted Students

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Introduction

Louisiana regulations define the academically gifted student as one "who possesses demonstrated abilities that give evidence of high performance in academic and intellectual aptitude" (Pupil Appraisal Handbook: Bulletin 1508, 1983, p. 51). Criteria for eligibility in the gifted program varies by age and grade according to an application of an achievement and aptitude/intelligence matrix which is used to assign points for various levels of attainment. A minimum IQ of 130 and a very high demonstrated achievement level (95-99) percentile) generally will qualify a Louisiana youth for special education services in the public schools.

Statistics from a recent count compiled by the Louisiana State Department of Education indicate that the number of students participating in programs of the gifted and talented increased from 700 students in 1975 to over 15,000 in 1987. The East Baton Rouge Parish School System gifted program has grown from 144 elementary and middle school students in 1975 to over 3,000 students, preschool through high school, in 1987. Commensurate with this dramatic increase in program expansion there has emerged a need to evaluate the academic and intellectual growth of the participating students at

various grade levels and in each program option (self-contained vs. resource room).

Typically, instructional evaluation is often the last dimension of program development to be addressed. Policy decisions and selection of instructional methods are dependent on current summative evaluation results. Parents, school board members, superintendents, and state legislators want tangible evidence that their monetary investments are "paying off". After the initial program development euphoria subsides, the public insists on instructional results.

Curricular Intent

In Louisiana, the curriculum for the academically gifted is defined by the state (*Bulletin 741: Louisiana Handbook for School Administrators*, p. 65):

a. Content that is compact and accelerated in such a way that the amount of time usually involved in mastery is significantly reduced;

b. Content that reflects a higher degree of complexity, emphasizes abstract concepts, and develops higher-level thinking processes than does content found in regular course work;

c. Content that goes beyond the prescribed curriculum to involve the application of learning to areas of greater challenge; and

d. Multi-disciplinary content that increases students' abilities to formulate and test new generalizations and/or products.

In addition, an *I*ndividual *E*ducational *P*lan is required in the program for each student as an educational blueprint—in self-contained programs, the valuational blueprint. In self-contained programs, the valuational component is often defined by levels of mastery learning (e.g., 80% correct), completion of student products, percentages of skills learned, or other similar notations. Contents acceleration in verbal and quantitative skills is encouraged. Resource room enrichment programs are based more on a philosophy of creative productivity in which students are expected to complete projects, investigate and solve problems, or do independent research. The evaluation challenge was to select an instrument that would measure both academic and cognitive performance compatible with the state curriculum guidelines and to analyze the overall impact of this special program.

Evaluation Instrument

The *Developing Cognitive Abilities Test* (DCAT—published by American Testronics, Post Office Box 2270, Iowa City, Iowa 5244) was selected to measure the higher level and abstract thinking skills and academic performance levels of the program students. The DCAT provides data in three content areas: verbal, quantitative and spatial. More importantly, it yields valuable information on five levels of Bloom's taxonomy: knowledge, comprehension, application, analysis, and synthesis. It has been developed for grades 2-12 and has 5 levels of administration. It takes fifty minutes to administer and is an 80 item exam. The evaluation intent was:

1. To interpret the results of the Developing Cognitive Abilities Test by grade level according to the curricular goals and objective so the program for the academically gifted.

2. To interpret the results of the Developing Cognitive Abilities Test with emphasis upon higher level thinking skills.

3. To compare the East Baton Rouge Parish test results with another gifted program using the same tests for higher level thinking skills.

4. To interpret the DCAT gains and differences over two years between two different administrative designs: self-contained vs. resource room.

Data used for the interpretation originated from selected schools and specific grade levels by students identified as gifted in the East Baton Rouge Schools tested during the Spring 1986 and 1987 administration of the Developing Cognitive Abilities Test (DCAT).

Results

The results of the extensive testing using the Developing Cognitive Abilities Test (East Baton Rouge Parish School Board, Developing Cognitive Abilities (DCAT) Test Results, Spring, 1987) indicated that the gifted students scored significantly higher than the national norm group in the content areas when comparing national group percentiles. All grade levels produced average scores in each content area that were above the 70th percentile. Further analysis of the data revealed some differences between two administrative designs: part-time resource rooms and full-time self-contained classrooms at selected schools. The all day programs which place emphasis upon content acceleration, as expected, did score higher than the resource rooms which operate on the philosophy of enrichment.

In addition, the DCAT produced significant results when measuring these cognitive abilities that can be altered through instruction, mainly the higher level thinking skills as defined by Bloom's Taxonomy. It appears that the students' intellect matures and as their programs challenge them to think in new ways, higher levels of reasoning skills are developed. An inspection of the percentage of items correct for the five clusters belonging to each of Bloom's cognitive classes showed a tendency for percent scores to increase with each higher grade in school. Again, all percent correct scores on these test items were higher than those obtained by the national sample in each cognitive area. This pattern strongly suggests that academic and cognitive performance as measured by the DCAT, increases with instruction and/or maturity. It was expected that growth would occur in the three upper levels (application, analysis and synthesis). Also, it would be expected that gifted students identified for the program would most likely score very high in the knowledge and comprehension classes. Further analysis indicated that length of program attendance had significant effects upon these scores.

The results from an instructional evaluation project using standardized tests of academic and cognitive thinking level provided evidence that concomitant intellectual growth is occurring from year to year and that the program is providing tangible evidence of an important investment in gifted and talented education.

Primary Gifted Education:
The Missing Link

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A bright eyed young child looks down at the reading workbook, up at you and begins to cry. Why? The thought runs through your mind. Why is this child so frustrated? You know the child is intellectually gifted, you know she has the ability to comprehend the work, but something is seriously wrong. As you think back you remember the decisions that were made. Rebecca came to kindergarten reading fluently, a happy child, well adjusted and well liked by her kindergarten classmates. Her intellectual and reading abilities were so advanced the decision was made to send her to a third grade reading group. Now you are frustrated and Rebecca is clearly upset. Were the tests wrong? Isn't Rebecca gifted? What do you do now?

This is an illustration of what is becoming an all to common occurance in a young gifted child's life. Frustration, stress and anxiety can easily be substituted for the pleasure, happiness and learning that should occur. Too often decisions are made based on efficiency for the school system and not often enough on the individual needs of a young gifted child. Additionally, we are facing continued pressure from parents and community members who insist on a philosophy of "academic push" or "the earlier the better" and ignore the developmental steps which contribute to effective learning.

The young gifted child is in a particularly perilious position. Given the unique level of cognitive functioning that is apparent how do we reconcile the physical and emotional levels of functioning that are apt to be more age appropriate? What are the inter and intra-individual differences that we see with young gifted children and need to be carefully considered? What are appropriate program designs for young gifted students? All of these questions should be addressed in order to provide appropriate programs for young gifted children.

Each child is unique and no child will exhibit all of the characteristics described but we do recognize some common attributes of young gifted children. Often a verbal precocity is demonstrated, using words and sentences to describe thoughts or ideas beyond those expressed by typical young children. Intense interest in certain activities may be accompanied by numerous questions (many of which we cannot answer!) Or the ability to follow complex directions and utilize problem solving skills is often demonstrated. The young gifted child presents unique developmental patterns. Their development is typically uneven with mastery at an early age in some areas and mastery at a more age-appropriate time for others. These uneven patterns of development can be termed developmental discrepancies. We find developmental discrepancies in cognitive, physical and social-emotional functioning. Developmental descrepancies are not cause for alarm, they are common; however when they are ignored, as in the case of Rebecca, they can cause failure, stress and anxiety for the young gifted child and teacher.

The education of young gifted children has the good fortune to be just one area of specialization within the field of early childhood education. Early childhood education, which encompasses children from birth to eight years of age, has a number of characteristics which facilitate the process of providing services to this special needs population. One very recent trend in particular helps to define a framework for conceptualizing education for young gifted children while also clarifying the challenges involved in the delivery of services. The trend of developmentally appropriate practices focuses our attention on both the inter-individual differences among children as well as the intra-individual differences within each child. Educators have acknowledged the former, noting the wide variability among children. However, the latter requires astute observation and sensitivity on the

educator's part in order to note apparent discontinuities in capabilities within an individual child.

The National Association for the Education of Young Children issued a position paper in 1986 which clearly defined the meaning and implications of developmentally appropriate practices in order to promote high quality services for all children. The position paper identifies two aspects of appropriateness: age appropriateness and individual appropriateness. Age appropriateness refers to the universal, predictable sequences of growth and change—a requisite body of knowledge for all educators. Individual appropriateness focuses on the individual differences one finds among children, the intra-individual differences among children of like chronological ages. Consideration of both aspects of appropriateness should guide us in our care and education of children.

As informed educators, we should all be familiar with the universal sequences of development. For this reason, we will merely highlight the expected capabilities within each of the developmental domains and concentrate, instead on the notion of developmental characteristics typical of young gifted children.

Physical development in the young child is marvelously observable. We see the newborn move from reflexive, unintentional behavior to controlled and intentional movement in a very short period of time. We observe as the infant develops the cephalo-caudal control (head to toe) and the proximodistal control (trunk to extremities). The toddler continues to refine both the gross motor movement and the fine motor skills. The preschool child works to hone these capabilities even further, demonstrating skill in running, jumping, hopping, artistic skills of beginning representational drawing.

Social development is apparent in the process of developing attachments between the newborn and those providing care in the environment. Eye contact and beginning communication (smiles, coos) serve to entice the individuals in the child's life to care and provide nurturance. The toddler and preschooler begin to assert and establish independence in those first three years. Friendships become increasingly important to the four, five and six year old child. She learns to play cooperatively, imaginatively.

The area of social and emotional development also presents unique challenges for teachers and parents working with the young gifted child. It often becomes a balancing act for the adult as well as the child. Comprehension and sensitivity to language, moods and environmental stimuli coupled with awareness that is often unsuspected

can lead to difficult situations. Parents and teachers often are heard to comment, "John is so sensitive, easily gets his feelings hurt or over responds in a situation." It is the unique intra-individual differences of the young gifted child which contributes to the unhappy scenario.

Comprehension of the language and interpretation of a situation by a five year old can lead to misunderstandings. Or assumptions by adults that because the child verbally acknowledges what you say that socially and emotionally they will react appropriately. One teacher aptly described a play ground situation in which two young gifted boys were arguing over the same toy. He approached the boys and asked them to cooperate. In order to avoid misunderstandings he asked the boys to define cooperation. They readily and correctly replied. Feeling as though the situation was settled the teacher turned to leave only to overhear from one young man, "but THAT toy is mine!" Hence the developmental discrepancy appears again, advanced language development but socially and emotionally more age appropriate behavior occurs.

Language development is one of the most dynamic aspects of the early childhood learner. The rapidity with which the young child becomes a skilled user of verbal and written language is awsome. The tools of communication are acquired in an easily observable progression. Advanced Language abilitities are often characterized in the literature as a unique attribute of the young gifted child. This area is usually found to be advanced in relation to chronological age peers. Even in this domain of development astute observations should be undertaken by parents and teachers. Assumptions of understanding and comprehension when using or hearing language cannot be made. Nor can we assume that because a child lacks the verbal facility to explain an idea that they cannot comprehend it.

Cognitive complexity and development are also areas in which we find developmental discrepancies. Children who are identified as gifted exhibit advanced levels of cognitive understanding in academic as well as in socially related tasks. Although such children are usually advanced when compared to age mates, we still see evidence of disparities in functioning. Occasionally we see the literal interpretation of cognitively complex information such as the parent telling the young child to "pick up your feet" and the young gifted child literally reaching down to do so.

On the other hand, Rebecca was faced with developmental discrepancies in two major areas. Physically, she was age appropriate for a six year old, but she did not have the fine motor skill develop-

ment of a typical third grader so the written work was very tiring and time consuming. Rebecca, although intellectually gifted, did not have the abstract thinking skills or problem solving strategies well developed enough to tackle such questions as, "How are an apple seed and story alike?" With group discussion and teacher support she may have been able to participate but she would still be faced with the volumes of writing required in upper level material. A frustrating and stressful situation.

Our descriptions are far from exhaustive. In addition, we know that every child exhibits developmental discrepancies. Although we believe development proceeds in a general sequence we know that there are shifts, gaps and discrepancies that occur. The young gifted child's development seems more pronounced when we look at these discrepancies. The difficulty for the child becomes apparent when we focus on one area of development which is advanced and expect all other areas to be equally advanced. Hence, we see undue burden placed on the child to perform.

Having examined the development of the young gifted child, we must turn our attention to developmentally appropriate programs. What is appropriate for the unique learning characteristics of the young gifted child? How do we design a program that can take into account the developmental discrepancies that become apparent? Should we wait until they're older and more developmentally stable? The current research literature supports early intervention, the importance of early intervention in the development of self-concept, and the need to extend curricular offerings through the regular primary classroom. Clearly, waiting until later, fourth grade perhaps, is not the answer.

A small number of programs are currently designed to meet the unique needs of the young gifted child. They provide excellent models; however, school districts are reluctant to adopt system-wide programming for preschool and primary age gifted children. This reluctance is due to lack of funding, identification procedures and lack of curricular offerings which address the unique intra-individual differences of these students.

One model program which seeks to address these issues is the consulting teacher model currently in use in the Duluth Public Schools. The focus of the consulting teacher model is to provide an interactive, integrated service delivery model for primary classrooms. The nature of the services from the consultant for gifted students varies

from year to year depending upon the needs of the teacher and the students.

There are three major provisions of a consulting teacher model: 1) to serve as a professional resource; 2) to provide curriculum development assistance;and 3) to provide direct instruction to young gifted students. While serving as a professional resource person the consulting teacher does such things as gathering appropriate instructional materials, locating speakers and providing mentors. Among the types of assistance in the curriculum development area are extension projects and activities, learning activities/packets and advanced units of study. In both long term (9 weeks or more) and shortlong term (9 weeks or less) instruction, teaching may occur on an individual basis or small group basis. The consulting teacher, in all cases utilizes the expertise of the regular classroom teacher for designing and implementing instruction. The curriculum is designed to be an extension of that used in the regular primary classroom, focusing on issues jointly determined between the consulting teacher and the classroom teacher. Long term instructions involves a more formal individualized plan for the child while thte short term instructional plans are handled more informally.

Evaluation of the project included data compiled in survey from from regular classroom teachers, administrators, parents and students. According to the evaluation data, the key factors of the consulting teacher model which contributed to its effectiveness were: 1) the development of curricular materials based on inter- and intra-individual differences; 2) assistance to the regular classroom teacher; 3) inclusive identification and spin-off to peer group; 4) communication with and support of parents; and 5) cost effectiveness in delivery. Key factors, such as these, give support to utilizing a consulting teacher model with young gifted children.

As we look at the young gifted child there are several thoughts which come to mind. First, is that they are young children. The natural sequence of development can provide a guideline for appropriate programming practices. Second, they are gifted. This unique individual difference contributes significantly to their development. The combination of early development and giftedness creates a disparity we call developmental discrepancy. The parents and teachers working with the young gifted child must create programs which are based in developmentally appropriate practices giving credance to inter and intra-individual differences found in young gifted children.

It is only with the concerted effort of early childhood educators and educators of gifted children that we will accomplish the goal of developmentally appropriate practice.

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Parallel Planning: Enrichment/Acceleration Ideas Within the Regular Elementary Classroom

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The concept of "parallel planning," is based on the need of "regular" teachers in the normal self-contained elementary classroom to meet the differentiated demands of a variety of student abilities. Particularly designed for use by teachers in buildings or districts where there is as yet no larger programs to identify and serve the "gifted" students, parallel planning does not need elaborate identification procedures, additional facilities, nor increased personnel. What it *does* need are open-minded, flexible, creative teachers who recognize that just as there are some students who learn more slowly, so there are some students who absorb information and process it more quickly, and who need to be challenged in more difficult and more creative ways in order to maximize their time in school. The ideas of parallel planning can also be helpful to parents of bright children who are searching for ways to assist the classroom teacher to meet the higher-level needs of their children, as well as methods for reinforcing their learning at home.

The ideas of parallel planning bear some resemblance to Renzulli's Enrichment Triad but the enrichment is confined within a single classroom rather than school-wide. All students participate in the Level 1 introductory activities, then those students who evidence interest and subject mastery move on to Level 2 activities. These are mainly individual and/or small-group projects which can be done at the desks, learning centers, or work centers equipped with materials and instructions. (For non-readers, the instructions could be pictures or given by the teacher on a cassette tape to be used with headphones.) Level 2 projects are designed so that all students in the class can participate once they understand the basic subject concepts, and the degree complexity depends on how involved students want to become, as well as their skills, interests, and amount of time available.

The underlying instructional concepts of Parallel Planning include the following:

1. The intent of parallel planning is to provide ways that all children can work in the same subject areas at the same time, on their own levels. Thus, math time is math time for *everyone*. "Gifted" children don't go off to exciting places while "regular" students have to stay behind in class or the "gifted" child sits bored having completed his regular math assignments waiting for everyone else to catch up.

2. Children are taught the idea of stewardship or ownership for their education and be allowed to help plan what they want to accomplish. Each child should have an IEP (Individualized Education Plan) worked out early in the year among parents, teacher, and child that lists areas of strength and weakness and sets yearly goals.

3. Standards of evaluation stating how each activity or project is to be judged or graded should be clearly stated in contract so that teacher, student, and parents know what is expected.

4. Although teacher can provide suggestions for Levels 2 and 3, children are encouraged to deveise their own creative projects within necessary guidlines.

5. All Children are taught methods of productive thinking—fluency, flexibility, originality, and elaboration—as well as steps of creative problem solving at the beginning of the year and encouraged to apply these higher-level thinking skills at all levels of work.

6. Flexible grading allows children to be judged in competition with himself, based on his ability, evaluation standards in his contract, and completion of project. Thus a child who works primarily on Level 1 but works up to his "capacity" has the same right to earn grades as a "gifted" child who works on Level 3.

7. Although the teacher can use parallel planning without outside help, parallel planning is even more effective if teacher can solicit help from a variety of people such as: parents, grandparents, upper-level children, teenagers, retirees, local professionals, etc.

Following are some examples of ways that parallel planning could be implemented in a self-contained classroom. The examples show kindergarten, grade 3 and grade 5 classes in language arts and science. These are merely a few suggestions; many other things could be done in these two areas and the concept can be applied to all subject areas and grade levels. (The "standards" referred to are the standards listed in the *Utah Curriculum Guide* as put out by the Utah State Board of Education, 1987.)

Science: Kindergarten

Standard 3000-02: "The student will categorize animals according to similarities and differences."

Level 1: Students learn that there are different kinds of animals of various sizes, shapes, colors, with differing body covering, habits, habitats, movement abilities, etc. Children are exposed to broad classes of animals via pictures, books, filmstrips, movies, and live examples.

Level 2: Students could cut out pictures of animals and make a book showing different kinds of animals categorized according to student choice, such as: Animals that fly, animals that eat other animals, animals with two (or 4, 6, 8, or more) legs, animals that make good house pets, farm animals, zoo animals, and so forth.

Level 3: Students would use an idea from a picture book but make categories more complicated and inter-related, such as: animals that have four legs *and* fur, animals with 2 legs that are eaten by man, animals that change form, etc. *Or*, the child could select one kind of animal to study and bring in an example (or picture or model) to show the class, and give an oral report on the animal's habits, food, habitat, etc. *Or*, the child could make a model or diorama or chart to show something special about animals being studied by the entire class. (The important idea is to let children CHOOSE what they want to do and SHARE it with others.)

Science: Grade 5

Standard 3050-03: "Students will give examples of the different states and forms of energy, identify different energy transformations, and discuss renewable and non-renewable energy resources."

Level 1: Students learn about various classes of energy, sources of energy, forms of energy, and energy states by reading text, teacher lecture, demonstrations, filmstrips, etc.

Level 2: Students could build models showing changing energy states (as water to vapor or ice) *or*, write a report, *or*, give an oral report, *or*, submit appropriate artwork, *or*, make a chart or display of things that produce energy, *or*, illustrate potential to kinetic to potential energy with marbles, etc.

Level 3: Students could do a research project about energy resources, *or*, make an invention using alternate energy sources or using traditional sources more efficiently, *or*, write an editorial for a newspaper about energy problems, using facts and figures from research, *or*, perform original research, etc.

Language Arts: Kindergarten

Standard 4000-03: "Students will learn the auditory and visual discrimination skills necessary to recognize letters and understand sound-symbol relationships."

Level 1: Students learn the alphabet and left-to-right, top-to-bottom orientation, being able to recognize letters and give their sound as well as to recite them. Students learn to recognize their name and spell it (Standard 05) and to write their name, alphabet, and digits 0-9 (Standard 06).

Level 2: (Those that already meet standard requirements.) Students can associate letters with words and cut out pictures from magazines to make their own alphabet booklets, or gather pictures and use glue-stick to attach to large charts showing various letters, or design letters into imaginative animals or other shapes, or "reads" books accompanied by cassette tape and headphones, etc.

Level 3: (Those that already can read.) Students can read books on their own (but should have some way of indicating comprehension), or read a story out loud to other students, or write words using certain word patterns, like "__at" or "__an" words, or work at learning centers with headphones, or help with Level 1 or 2 students, or read with older students, parent volunteers, etc. They also could do "language experience" if someone were available to record their

words when they read it, or they could combine reading with puppets, play production, poetry, or make books with cut-out or original pictures and words.

Language Arts: Grade 3

Standards: (Given in listening, speaking, reading, literature, spelling, penmanship, written composition and drama.)

Level 1: Students should read on grade level in reading groups with correlating spelling, literature comprehension, and writing skills. They usually have a reading workbook, ditto sheets, and might keep a journal.

Level 2: Students could find examples of homonyms and post on a chart in the room, or read a story and illustrate with pictures or a diorama or "TV" scroll, or write a sequel or different ending of a story they liked, or act out a story with classmates, or do written or oral book reports and presentations while dressed up as a character, or do research about an author for a written or oral report.

Level 3: Any Level 2 activities in more depth, breadth, and detail. If students have progressed through all reading levels in the classroom, they often can go to higher-level classrooms for reading, but should still have opportunity for creative work. If students have gone as far as the highest reading level in school, emphasis should be placed on creativity and students should be encouraged to *produce* original work that can be shared. Journals should include thoughts/feelings/plans as well as events. Many books should be available to read, including junior classics, biographies, science fiction, non-fiction, and poetry. Students can keep track of the number of books and/or pages read, including information on the author, illustrator, publisher, number of pages, date, and short description or synopsis. Creativity should be encouraged in book reports via art, drama, and various media. Students could write poetry or articles or stories for publication in school paper, or participate in Young Authors, or write and put on plays, or perform research, etc. Students should become familiar with libraries, both school and public, and learn basic research skills. They should become competent computer users, and should be exposed to (an)other language(s) if possible.

Thus it can be seen that the concept of parallel planning is flexible enough to be applied in many different ways to different subject

areas, different teachers, different classrooms, and different ability levels of students. It can be custom tailored to fit the needs of particular teaching and learning styles, and modified enough to appeal to all students, no matter what their interests. parallel planning can keep all students "on the right track" . . . the track of learning!

A Three-Dimensional Model for Individualizing Instruction for Gifted Students

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The purpose of this paper is to stimulate discussion which may help us rethink our definitions of giftedness and the ways in which we program for the gifted. The paper grew out of a sense that the complexities of giftedness are often ignored in identification procedures and in programming efforts that are based on idiosyncratic views of giftedness, on mechanistic procedures, and on fragmented efforts to promote the development of giftedness.

Three Types of Characteristics

A model is proposed which incorporates three types of characteristics that are important to achieve a high (i.e., gifted) level of performance. They are:

1. Aptitudes —defined as enduring capacities that are relatively unaffected by specific learning experiences.

2. Specific knowledge and skills —abilities that constitute the tools necessary for a specific kind of functioning.

3. Affective characteristics —the attitudes, feelings, values, predispositions, and similar traits which determine how a person functions in a particular area.

The level of a person's performance in a particular endeavor depends on his or her aptitude for that activity, on the knowledge and

skills that are relevant to that kind of endeavor, and on affective characteristics that shape the ways in which the other characteristics will be applied to the endeavor.

Assessing the Three Types of Characteristics

For most kinds of performance, it is likely that each dimension might be assessed by several measures. Of the three dimensions, *knowledge and skills* can probably be most easily measured in a straightforward fashion. The subtests on standardized achievement tests are intended to do this in various subject areas.

Measuring *aptitudes* presents a more difficult problem, since our measures tend to confound aptitudes and specific kinds of learning. For example, intelligence tests usually include vocabulary or some other aspect of language development, which we would classify as knowledge and skills.

Assessing *affect* presents additional problems because, at least in some instances, we are trying to measure inner states that often can only be inferred from behavior.

Placing the Characteristics in Three Dimensions

In order to accommodate the interactive nature and the distribution of the three types of characteristics, a three-dimensional model is proposed. It can be visualized most simply as a equal-sided cube, with right angles at all 8 corners. *Aptitudes* make up the vertical dimension, *Specific Knowledge and Skills* the horizontal dimension, and *Affective Characteristics* the front-to-back (depth) dimension.

It is assumed that traits on each of the three dimensions are distributed somewhat like a normal cube. Sketched customarily, there is a zero point at the lower left front corner for all three dimensions of the box. Thus, people can "score" anywhere from the bottom to the top of the cube to show differences in *Aptitude*; anywhere from left to right to show differences in mastery of *Knowledge and Skills*; and anywhere from front to back to show differences in *Affective Characteristics*. With the assumption about a normal frequency distribution in each dimension approximates a "normal curve", the majority of people would be found clustered around the middle on each dimension; taking all three dimensions into account simultaneously, this would place them in a cluster in about the center of the cube and becoming less closely clustered as they spread in all directions from

the center. People with extremely high or low "scores" would be found at the extremes, especially near the corners of the cube. Therefore, it is at (or near) the corners that we can start looking for people that might be described as most "gifted," either essentially one dimensionally or two dimensionally, or three dimensionally.

Possible Combinations of Characteristics

Extremely high levels of functioning considering only one dimension at a time, are represented by one face of the cube: high *Aptitude* by the top face; high levels of *Knowledge and Skills* by the right-hand face; and high levels of *Affective Characteristics*, by the back face.

The corners of the cube represent the intersection of extreme levels on each of the three dimensions. Considering each set of two dimensions at a time, on the top face, the *first* (top-back-left) corner represents high levels on *Aptitude* and on *Affect*, but not on *Knowledge-and-Skills*. The *second* (top-front-right) represents high levels on *Aptitude* and on *Knowledge-and-Skills*, but not on *Affect*. The *third* (top-left-front) corner represents a high level on *Aptitude*, but not on *Knowledge-and-Skills* or on *Affect*. Finally the *fourth* (top-right-back) corner represents high levels of functioning on all three dimensions.

So far this only deals explicitly with the four corners of the top face of the cube. In dealing explicitly, likewise, with the four other corners of the bottom face of the cube, the bottom-right-front corner would indicate persons who would be high on *Knowledge-and-skills*, but not on *Affect* nor on *Aptitudes*. In the bottom-right-back corner the person would be high on *Knowledge-and-skills* and on *Affect*, but not on *Aptitudes*. The person at the bottom-left-back corner would be high on *Affect*, but not on *Knowledge-and-skills* nor on and *Aptitudes*. Finally, all persons on the left-front corner of the bottom face would not be high but would be so low on all three (*Knowledge-and-skills, Affect, and Aptitudes*) that according to this scheme, none of them would ever even be considered for serious selection in the gifted program.

These are just the extremes, of course. As we look at the corners for illustrative purposes, let's not forget that students could theoretically fall anywhere one-dimensionally along the 8 edges and anywhere two-dimensionally on each of the 6 sides of the cube those who are predominantly three-dimensionally would fall within the cube (i.e., inside the faces, edges, and corners of the cube.)

Implications for Program Planning

What does each corner mean in terms of students' characteristics? Let's take the student in the first corner above, who is high on *Aptitude* and on *Affect* but low on *Knowledge-and-Skills*? This student has high potential which may only be partially realized because he/she is lacking in the necessary tools. His/her program would have to emphasis, at least initially, the development of appropriate tools in order for the student to be able to work at a level commensurate with his/her *Aptitude*. First, this student may be overlooked in programs for the gifted; he/she may not be selected for a program that places heavy emphasis on knowledge and skills in the identification process; or, if he/she is selected, the teacher may erroneously assume that he/she has well-developed knowledge and skills and wonder later why he/she isn't performing well.

The second student shows high levels of *Aptitude* and *Knowledge and Skills* but not *Affect*. This student has the tools but lacks some affective component, such as motivation. His/her program would have to consider the affective dimension as a priority. Whether it could be attacked directly or whether affect would change in a desirable direction as attention is given to the other dimensions might be determined as the student proceeds in the program.

The third student is high in *Aptitude* but low on both of the other two dimensions. The complex interaction between *Knowledge and Skills* and *Affect* may make it difficult to know where to begin. should the student's program concentrate on developing the *Knowledge and Skills* he/she lacks, or would that frustrate the student? Would it be better to begin by providing for the *affective* characteristics by, for example, trying to increase motivation through activities that utilize the student's strengths?

Finally, let's take the fourth student in the corner, where he is high on all three dimensions — *Aptitude, Knowledge-and-skills*, and *Affect*. That's the kid every teacher wants! A program of this student would be designed to allow him or her to explore the extent of his/her potential. It would most likely be a program which gives the student a great deal of responsibility for determining his/her own learning objectives, procedures, and products. (Similar logic would follow for students on the bottom side of the cube.)

In developing a program for a gifted student, the teacher would first look for one or more measures or indicators of characteristics associated with each dimension. He/she would then assess the stu-

dent's level of functioning on the different measures or indicators in order to determine where the student stood on each of the three dimensions of the cube. The assessments may be objectively obtained through testing or subjectively determined through judgments of behavior or products.

Whatever the form of assessment, students are not likely to fall as neatly at the four corners of the cube as was the case with the examples given above. However, data on a student may show relatively high standing more on one dimension than on one or both of the other dimensions, thus providing the teacher with a starting point for developing an educational program for this student.

An Examination of
Identification Procedures

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Educators are finding that the needs of a significant number of students with superior artistic abilities cannot be met in regular school art programs. One way of providing for these students had been to develop special programs specifically designed to provide accelerated and intensive kinds of experiences. A good number of these programs for the gifted/talented in the visual arts are already in operation, and other programs continue to be developed. In most programs, students are selected on the basis of one or a number of identification and selection procedures. This study examined the effectiveness of four identification procedures as predictors of success in a gifted and talented studio-based art program at Purdue University. The effectiveness of the identification procedures used in the Super Saturday Visual Arts Program (SSVAP) was studied among 29 kindergarten through twelfth grade students by examining the correlation between the identification procedure scores and scores from assessments of student products and progress.

Identification procedures utilized by gifted and talented programs, according to Clark and Zimmerman (1983 a & b), need to be critically examined. The Super Saturday Visual Arts Program offered on the West Lafayette campus of Purdue University, provided an ex-

cellent opportunity to examine the identification procedures used in a K-12 gifted/talented studio art program because it was quite typical of many gifted/talented art programs for elementary and secondary students in that it was offered as a supplement to regular school art programs, was held outside of school time, was staffed by experienced K-12 art teachers, and used a variety of identification procedures.

All of the students that participated in the SSVAP were subjected to the same identification procedures: (a) structured nomination; (b) performance observation; (c) evaluation of a timed-work sample; and (d) evaluation of an entry portfolio.

The structured nomination form examined in this study was the Artistic Characteristics dimension of the *Scales for Rating Behavioral Characteristics of Superior Students* (SRBCSS) (Renzulli et al., 1976). Teachers and/or parents using this form were asked to rate the frequency of the artistic behavioral characteristics observed in the child.

The performance observation, a measure designed specifically for the SSVAP, took place during a group studio session. While students worked on a timed studio assignment, the SSVAP teachers observed the way in which those students used art tools and materials; the students' deliberateness of planning, application, and execution; the level of each student's enthusiasm; and level of each student's independency or dependency on other students' actions.

The product evaluations of students' entry work included both an evaluation of the timed-work sample produced during the performance observation, and of an entry portfolio consisting of four original drawings which prospective students were asked to bring with them to the performance observation. The product evaluations of students' timed-work samples and entry portfolios were measures designed specifically for the SSVAP.

For the purpose of evaluating the effectiveness of the identification procedures used in the SSVAP, scores from the identification procedures were compared to scores from assessments of student art work and student progress reports. The assessments of student work produced during the nine-week course were conducted by the SSVAP teachers and by six outside judges. The program teachers assessed the students' coursework portfolios and completed checklist progress reports developed by the Purdue Gifted Education Resource Institute

(Douglas, 1984). The six outside judges assessed the merit of the students' entry portfolios, timed-work samples, and coursework from the third, fifth, and seventh weeks of class. The effectiveness of the identification procedures as predictors of success was examined by studying the correlation between the identification procedure scores and scores from assessments of student products and progress.

Significant correlations were found between the SRBCSS Art scale scores and scores from SSVAP teachers' ratings of coursework portfolios and outside judges' ratings of seventh week coursework. Significant correlations were also found between the performance observation scores and the coursework portfolio scores, scores from the student progress reports, and scores from seventh week coursework. No significant correlations were found between either the scores from the entry portfolios of the timed-work samples and the scores from the coursework portfolios, student progress reports, or seventh week coursework.

The data indicated that over a seven week period of time in the SSVAP, the students' studio art products, as assessed by the outside judges, showed more concomitant variation with the initial estimates of students' artistic behavioral characteristics. This indicates that estimates of students' behavioral characteristics in art are not equivalent to estimates of students' early work (third and fifth weeks), but are more in accordance with later work. This suggests that how students develop under instruction assessments of their art products conforms more closely to entry level estimates of their artistic behavioral characteristics.

Conclusions

The following conclusions appear reasonable from the results of this research.

1. Even though the SRBCSS Art scale and performance observation yield similar estimates of students' behavioral characteristics in art, and the timed-work sample and entry portfolio of drawings both yield similar estimates of students' demonstrated artistic abilities, the lack of significant correlations between these two categories suggests that estimates of students' behavioral characteristics in art are not equivalent to estimates of students' demonstrated artistic ability as manifested in their entry level art products.

2. Art teachers who know a student's general and artistic abilities will provide similar estimates of those abilities even when rating the student's performance on two different kind of rating instruments.

3. The SRBCSS Art scale is a valid predictor of student success in a gifted/talented studio art program.

4. The performance observation is also a valid predictor of student success in a gifted/talented studio art program and may yield better predictions of success than the SRBCSS Art scale.

5. Information regarding students' artistic behavioral characteristics, rather than entry product evaluations, may be the most valid predictor of future artistic performance in K-12 studio based gifted/talented art program.

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The Challenge to Africa:
The Search for Excellence
Especially Among Black South Africans

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The many complex problems of Africa and especially of Southern Africa will only be solved in time *if the best minds & personalities of those communities are involved*. This implies that every effort has been or should be made to identify as early as possible the actual, known and potential *"Leaders"* in all strata of society and in all spheres of life and to ensure they have been or will be provided with the education and training to enable them to achieve somewhere near their maximum potential as well-balanced personalities.

Because there has never been compulsory attendance at school for Black pupils in South Africa about 50% of those attending school have left or will leave after Std 2 or the 4th year of education. In addition the low standard of living and a lack of a Western cultural environment in many Black homes implies the need for "special education" for many adults and children, both formal and informal.

We are or should be looking for the top 3% of the population who are likely to be "gifted and/or talented", not only intellectually but in any sphere of life, i.e., we are looking for the 600,000 Black "people" or the 210,000 Black pupils/students likely to fall into that group. Unfortunately at present there is no intelligence test for Blacks but the Human Sciences Research Council hopes to have one

printed in Zulu and Xhosa, similar to the WISC test, by about July 1987 and one in Tswana by December 1987. This should help the identification of pupils/students between the ages of 9-19. Efforts to identify these "Children of Gold" should be made in all strata of society, especially in the very low income groups and for the rebels, the divergent thinkers, the under-achievers. Unless these children (especially the last 3 groups) are identified early and given challenging, learning situations, one printed in Zulu and Xhosa, similar to the WISC test, by about July 1987 and one in Tswana by December 1987. This should help the identification of pupils/students between the ages of 9-19. Efforts to identify these "Children of Gold" should be made in all strata of society, especially in the very low income groups and for the rebels, the divergent thinkers, the under-achievers. Unless these children (especially the last 3 groups) are identified early and given challenging, learning situations at home and at school, they may become under-achievers, drop-outs and even criminals.

There is much direct and indirect opposition by authorities of all kinds to the establishment of an *"Elite Group"* who, I claim, should receive special attention as is now given to the handicapped with generous support, including the establishment of *Special Schools and the Appointment of Special Teachers*.

But as Ruth Strang pointed out ". . . the danger of creating an elite is not as serious as the danger of wasting human resources by failing to help individuals make the most of their abilities." Dr. J. W. Gardner ("The Great Talent" page 284) wrote ". . . in the conditions of modern life the rule is absolute: the race that does not value trained intelligence is doomed".

About 15 years ago I arranged for the translation into Xhosa of 5 or 6 of my pamphlets of advice and information for parents and teachers regarding the education of all children but especially of their "Children of Gold". That project should be revived and extended to include translations into the other main Black languages. The assistance of the Private Sector, in their own interests, to ensure enough top brains by the year 2000 should be solicited.

"No problem is insurmountable: It just takes effort" (Mrs. Constance Nkosi: the first Black woman to take and MBA in South Africa: presently manageress, S A Permanent Building Society: KWA XUMA: SOWETO: JOHANNESBURG)

"Faith can move mountains but only hard work can put tunnels through them". (Mr. G. Mosimanegape: Director, Consultative Construction Co., Geneva: Switzerland.)

Possible Solutions to the Problems of Black Education in South Africa:

1. *Compulsory Attendance at School:* This should be made compulsory—voluntarily by the community—or legally by the Department of Education and Training for all Black Children, *at least* for ages 5 to 15.

2. *Reduction of Overcrowded Classes*: By the appointment (and so training) of *additional Teachers instead of the erection of buildings*—at this stage. The fact remains that one school building could accommodate *at least* two schools in each 24 hours. In Shanghai a number of buildings accommodate 3 or 4 schools in each 24 hours.

3. *Emergency One Year Training of Adults*: From the private sector as teachers, as introduced after World War II in Britain which was an outstanding success, should be a priority. Their experiences in the *Real World* (in which few Teachers live) provided them with a background which was of great value to their pupils.

4. *Provision of Electricity in all Urban and Rural Schools*: To ensure the admirable programmes on video, TV and Radio will be used for efficient learning and teaching in all school and their pupils, especially in the rural areas. Overhead and slide projectors, 16 and 8 mm films, computers as well as TV and radio will help to remedy the inadequate "cultural background" of many Black homes (p 13 Barzun): Merely looking at a news programme on TV, let alone listening to or looking at the other programmes, will do much to widen the mental, social and emotional horizons of the present "electronic equipment illiterates" among the Black community.

5. *Adequate use of School Buildings*: At present nearly every school building is in use only for about 6 hours a day: for 5 days a week: for 200 days a year. The development of *Community Schools* (the property of each person / taxpayer) using the many school buildings and rooms for at least 16 hours a day: for 7 days a week: for 360 days a year is imperative if we, the taxpayers, are to get value for money. In USA some schools are open for 240 days a year for 8 hours a day, offering specialized training for the gifted and talented,

most of whom welcome something constructive to do during the 3 months "holidays", The Community should be encouraged and trained to use the school for many of its hobby/social/charitable activities. It is their property, paid for by taxes. The school library, kitchen, the gymnasium, the arts and craft rooms, classrooms and the hall lie idle for many hours each day.

6. *Provision of Special Schools, Specialist Teachers and of Facilities for the Gifted and Talented is Imperative*: the provision of Magnet Schools (offering specialist advanced teaching in one or two subjects as well as other subjects); of Withdrawal classes from nearby school; of from different classes ina school for an hour a day or for one day a week, and enrichment classes and of special equipment, is often required to assist in the identification process of these "Children of Gold" and in providing the challenging, learning situation this group especially require. Special provision allowing for acceleration (the most effective system for the gifted to prevent frustration and under-achievement) and for early admission to Primary or Pre-Primary schools should form part of the Departmental regulations which should also allow for compilation of special syllabuses; the appointment of Co-ordinators to work with the ordinary class or subject teacher as an additional member of staff is imperative. Special training should be available at Teachers' Centres and Colleges of Education of Teachers of the Gifted to ensure they can meet the challenge of highly intelligent, intellectually-gifted pupils.

7. *Provision of a Modern Industrial Cultural Background in Most Black Homes*: It is imperative that the Community be "educated" to realize the important part that *parents* (and especially *fathers*) play and should play in all education, but especially in the education of the Gifted and Talented who should form the *Leaders* of the future. Provision of "cultural backgrounds" may have to be provided by schools and "After-Care" organizations using the facilities available. Special staff may have to be appointed if teachers are not always available in the "extended school year" to act in loco parentis, and help to provide the background which most White families take for granted, and which are essential for the gifted and talented to prevent frustration and underachievement.

8. *Adequate Provision of Libraries: Science Laboratories: Books of all Subjects: Stationery and Writing Equipment: Playing fields and Equipment*: As the aim of all education, but especially for the gifted is, or should be, the development of a well-balanced person-

ality who has been encouraged to achieve as near as possible to his inherent potential, it is imperative that the teachers — and pupils — say to the Community *"Give us the tools (all the points mentioned above) and we will finish the job (of educating our future leaders for whom we should search)."*

A Consumer Validation Study: What Do Gifted Children Report About The Match Between Their Ideal And Actual Gifted Programs

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The fortunes of gifted children seem to be especially susceptible to changing national moods. Three distinct waves of gifted programming have swept over the United States since 1957: Accelerated content programs, process programs, and student-centered programs (Tannenbaum, 1983). Instead of overlapping like shingles and existing simultaneously, though, this story shows that each existed, for a time, as the dominant, monolithic model, only to be replaced by a dominant, monolithic successor. The programs in the three waves differed one from the other, but they were not differentiated: Only seldom have gifted students had access to more than one kind of gifted program at the same time and in the same place.

Programs for the gifted have again proliferated, as they did in the Sputnik Era. A 1985 study sponsored by the Sid Richardson Foundations (Cox, Daniel, & Boston, 1985) of all 16,000 American school districts found that all who responded had some sort of program. Less clear, though, is that these programs were appropriate for the gifted students they were to serve. What makes a program appropriate for a particular gifted child, for gifted children as a discreet educational population?

This study sought to determine whether students in three sixth grade programs based on different models could describe their learning needs in ways that were related to the literature on appropriate strategies for teaching the gifted and whether they would be able to describe models of their gifted ideal programs in ways that were not limited by their experience in gifted programs. Affirmative answers to these questions could help reveal ways of obtaining reliable and valid data with which to plan programs which meet gifted students' needs, determine whether any particular set of options is especially appropriate for educating gifted students, and establish whether the students themselves could participate helpfully and reasonably in the process of determining what is appropriate for them.

Current research strongly recommends actively involving children in setting and meeting educational goals. Although there has been a great deal of study on school attitudes, none could be found that asks gifted elementary youngsters to assess and make recommendations on their own school experiences. An Educational Resources Information Clearinghouse computer search listed 90,692 studies on the impact of grouping, only 85 dealt with the impact of grouping on gifted and talented children. Of the 43,217 studies on role conflict, school attitudes, and quality of life of school children, only 23 dealt with gifted and talented children. Indeed, we have one hundred thousand studies of school aged children, but only 1% of them included giftedness as a descriptor — even though the gifted comprise 5-8% of that population as a whole. The advanced verbal and reasoning skills (Seagoe, 1974) that characterize academically gifted children suggest that they more than other school aged populations could appropriately provide the type of self report data used in assessing student attitudes.

The 57 (31 males and 26 females) subjects were asked to distinguish between two different programs, the programs they were currently in (which they described by giving their perceptions of their teachers' goals for that program) and the programs they thought would be ideal for them. They performed two Q-sorts using the same 40 statements, which were taken from the list of 106 recommended practices in educating and upbringing the gifted generated from textbooks on the gifted by the Knowledge Utilization Task Force of the Council for Exceptional Children-Talented and Gifted Division (Shore, Cornell, Robinson & Ward, 1986).

Data analysis employing the computer program *Concourse* (Nesterenko & Wilson, 1980), which performs factor analysis by extracting centroids based on the Guilford-Lacey criterion, showed that the subjects distinguished between their present and ideal gifted programs. It also showed that the students in each gifted program shared similar views of the ways they thought their teachers perceived the goals of the program.

Eight factors emerged, four from each condition of instruction. All eight factors were different, with no significant correlations among them. The factors accounted for the same number of subjects (43) in each condition, only two subjects did not load in either condition, and no subject was counted who loaded on more than one factor per condition.

By analyzing the specific combinations of attitudes constituting each of the factors that emerged when the subjects described their ideal gifted program, this researcher recognized that each of the four factors described one of the four major program models which have constituted gifted education in the United States since 1957 and named them accordingly: Advanced Content, Interest-Based, Cognitive/Affective, and Cognitive Styles.

In ranking statements about recommended teaching strategies for gifted education taken from textbooks in the field (Shore, Cornell, Robinson, & Ward, 1986) the students appeared to endorse as "appropriate" several of the types of gifted programs that experts have recommended and that the nation's schools have provided (Marland, 1972; Cox, Daniel, & Boston, 1985). In the last thirty years, the focus of "appropriate" programming for the gifted has moved from content to process to the student (Clark, 1983). Some of the subjects in this study described an ideal program that matched each of these program types, but no one type predominated as an ideal.

Currently if students have access to any gifted program, its nature is determined by the accidents of time and place, not by the actual, diagnosed needs of its individual participants. Although gifted children share some important characteristics and have some of the same learning needs, the individual differences that also exist among them (e.g. Rogers, 1986) mean that no monolithic system, which delivers the same thing to all students, can meet all those needs equally well. The fact that even this relatively homogeneous sample of gifted students produced four distinct ideal models does not support the myth that one program fits all.

American education has traditionally focused on developing individuals. In keeping with this tradition, to serve individuals well, we will have to base programs less on the changing national mood than on the enduring characteristics of those individuals the programs are to serve—the gifted.

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Project Success Enrichment

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Project Success Enrichment is a nationally-validated enrichment program in language arts and art, which is designed to enrich the education of intellectually and creatively gifted and talented students. Although JDRP approved for grades 4-6, it has also been field tested in grades 2-8. The program provides students who have a talent and/or interest with an in-depth study into these specific content areas. It allows students who have out-distanced their peers to be challenged.

Special Features of the Program

— a unique, culturally fair, evaluation design which involves actual student products
— an identification procedure which is specific to the content areas of language arts and art, that gives equal weight to standardized test assessment, teacher/parent recommendations, samples of student work, and characteristics checklists to ensure that students with alternative learning styles are included.
— a curriculum which sequences and integrates content and thinking skills by using a specific process approach that has been nationally-validated.

— a training component and curriculum manual that encompasses all phases of the program operation.
— elaboration, originality, problem-solving, and higher level thinking are stressed, based on the research findings of Torrance, Bloom, Williams, Meeker, Renzulli, Bogan and Sperry.
— the hands-on approach and cooperative learning methods enhance self-management and social interaction skills.
— the flexibility of the program allows curriculum to be used with students of all abilities, including special education.

History

The need for an enrichment program became apparent in a small school district, including two American Indian tribes, where students were out-distancing their peers in certain content areas. The identification procedures and subsequent program took into account the diversity of cultures to include all learning styles. The organizational model was kept flexible so that the instructional strategies for content, process, and products could be implemented within a variety of settings and budgets.

Curriculum, which was adapted and/or developed, focused on decision-making, problem-solving, higher level thinking skills, and creativity. In addition, self-management and social skills were emphasized throughout the curriculum structure, delivery, and methodology.

At the end of the first year, student growth in language arts and/or art was evaluated by the comparison of pre and post student samples using a panel of experts in writing and art from the local businesses and the school community. Students who completed the language arts and/or art program improved their prose and poetry or drawing and painting skills as demonstrated by a statistically significant proportion of their projects being rated as better than those of control students (.05 level of significance).

Staffing and Delivery Systems

The minimum requirement for a pullout/resource room delivery system is one full-time equivalent teacher-coordinator for each 20 hours of instruction per week. This allows the school or district to offer 10 classes or sections per week. Regular classroom teachers, librarians, para-professional (non-certificated) and community re-

source staff may also be utilized to teach under the direction and guidance of the trained teacher-coordinator. Regular classroom, pullout/resource staff may also be utilized to teach under the direction and guidance of the trained teacher-coordinator. Regular classroom, pullout/resource room, or cluster groups may be used for instruction. Participants may be relieved of regular classroom attendance, or a teacher may use the curriculum for the whole class, setting different expectations according to student ability levels.

Curriculum

The language arts curriculum includes four areas 1) Imagery: similes, metaphors, and personfiications. 2) Vocabulary: descriptive adjectives and word expansion, 3) Sentences: order, types, and 4) Format: organization, theme. Upon mastery of these topics, learners study various types of poetry and short story writing in-depth. Both oral and written communication skills are stressed through various teaching strategies. Sufficient curriculum materials are available for four years of instruction, depending upon the delivery system adopted and the grade and ability level of the students.

Language Arts Curriculum

The language arts curriculum is embodied in units, each of which includes: goals, objectives, learning activities, teacher strategies and instructions, and student work samples. The units are listed below:
— *Language Arts Introductory Unit* - This unit includes: word expansion, sentence expansion, imagery, patterns in poetry, descriptive paragraphs, fantasy, adventure, creating composition, and rhyming poems.
— *Language Arts Short Story Unit* - This unit includes: narrative biography, secret agents, story and poem starters, grab bag activities, author's point of view, and interdisciplinary application projects that focus on different styles of writing, i.e., historical fiction and high fantasy.
— *Language Arts Drafting, Editing, and Preserving Skills Unit* - This unit includes drafting activities to assist students in learning how to start and keep a continuous flow of words and ideas. There are various techniques and questioning strategies that assist the student in this process which builds perception and analysis abilities. There are activities that can be used si-

multaneously with the introductory unit and later with the other in-depth study units. There are definitions of writing and literature skills and questioning strategies that can be used when editing different pieces of writing, as well as a punctuation handbook for student use at all times.

— *Language Art Literary Analysis Unit* - This unit contains worksheets that can be used with all of the Newbery Award winning books. There are definition sheets and activities that present the elements of literature (theme, plot, characterization, setting, anti-climax, and climax, etc.) and activities that facilitate the analysis of literary works using the elements and the forms of expression that can be used to present the conclusions drawn from the analysis. The analysis process can be used with any literary work as well as the pieces listed, and lends itself to application and integration into other disciplines.

Art Curriculum

The art curriculum emphasizes drawing, painting, and claywork. After completing skill awareness and skill acquisition activities, students embark on individual projects. The art curriculum is disseminated in units as follows:

— *Art Curriculum Drawing Unit* - This covers line, three dimensionality, composition, shading, detail, and proportion. Pen and ink, pencil, felt pen, charcoal, crayons, and colored chalk are the media topics covered.

— *Art Curriculum Painting Unit* - This unit covers: color, dark and light (value and intensity), theory, pattern, texture, balance, and composition. Watercolor, tempra, and oils are media topics included in this unit.

— *Art Curriculum Claywork and Sculpture Unit* - Topics include: pinch method, wedging clay, coil method, clay figures, pottery, sculpture, decoration, throwing a pot, making a pitcher, making a lid, and kiln firing.

All units include extended activities that integrate other disciplines.

The qualities that make Project Success Enrichment unique are the curriculum sequence and integrated process approach. The sequential steps are described in the different skill levels of the learning hierarchy:

— *Skill Awareness* - Students are first introduced to content.
— *Skill Acquisition* - Students learn concepts and principles that relate to the content.
— *Skill Mastery* - Students practice, polish, and display their skills.
— *Skill Application* - Students evaluate their own work and that of others.
— *Skill Sharing* - Students demonstrate or introduce their skills to others.

Further information may be obtained by writing to the author of the paper or by phoning (206) 325-5418.

Challenges and Troubleshooting of Problems in Gifted Programs

The Rise and Demise of Gifted Education in California

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California has been a wellspring of gifted education for the United States of America and the World. California has shared research findings, generative ideas, and practical guidelines. As a result, other states and nations have benefited from: research-based programming of pupils; taxonomic approaches for improving higher intellectual skills; observation/demonstration centers; and administrative structures for assuring valid and reliable identification; appropriate placement in a range of program options; and qualitatively different and uniquely appropriate education.

Having attained a degree of eminence in researching, identifying and serving gifted children, one would assume continuing leadership and support from California. This is not the case. Deterioration is evident. The Gifted and Talented Education program is in jeopardy. It could be terminated in 1988!

Choked by the insensitivity of legislators; the lack of genuine commitment (which means follow-through support) by state offi-

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1. Prior to March 1989 (1961-1987), he served as the Gifted Education Consultant and Federal Project Director for the state of California and assistant Chairman of the 2nd World Conference in San Francisco, California, USA.

cials; restrictions of a stultifying bureaucracy; and hedonistic priorities of society, gifted and talented education in California no longer has the force, the quality, and the promise that it once had. In this presentation, I will:

1. Identify factors which have contributed to the rise of gifted and talented education programs in California from 1960-1987;

2. Identify factors which are contributing to the demise of such programs; and

3. Describe what can be done to transform the California Gifted and Talented Program so that it can again be a major force in developing extraordinary intellectual, academic, high-achievement, creative, leadership, and performing and visual arts ability—demonstrated and potential!

I will focus my remarks on crucial factors affecting gifted education in California during the tenure of four superintendents of public instruction: Dr. Roy Simpson (1950-1962); Dr. Max Rafferty (1963-1971); Dr. Wilson Riles (1972-1984); and Mr. Bill Honig (1985-today). Assisting this messages with their own presentations on school district-level problems and solutions are four prominent California educators:

1. Robert Swain, Director of the Second World Conference on Gifted and Talented Children and former Gifted Program Director in the San Juan Unified School District—a school district which in recent years had 65 elementary schools, 10 intermediate schools, and 11 high schools, all with 5,000 participating gifted students. Mr. Swain was also president of the California Association for the Gifted.

2. Fay Fintel, Resource Teacher in the San Diego Unified School District and leader in both the Association for San Diego Educators of the Gifted and the California Association for the Gifted. San Diego is nationally recognized for outstanding program provisions and careful assessment of the gifted since 1950. Today 6,000 pupils participate. Three exemplary features are exemplary programming for highly gifted students, a "Structure of Intellect" scchool, and comprehensive staff development.

3. Bruce De Vries, former Gifted Program Director in the Ukiah Unified School District. Mr. De Vries also served as a president of the California Association for the Gifted. This year, his Yokayo School was one of the few schools which received an award of Excellence from the California State Department of Education.

4. Joan Estin, is a teacher in the Gilmore intermediate School in a rural, mountainous, gold-mining area of California. Her prominence is evident in the quality and depth of thinking and moral and ethical development of her students.

It is evident in the high esteem with which she is held by parents and other members of the Grass Valley and Nevada City Communities.

A gifted child in California is an individual whose capacity for excellence is far beyond chronological peers —and whose extraordinary abilities require special activities and services. The program grew from 38,000 pupils in 188 school districts with $1.3 million of funding in 1961 to 220,000 pupils in 428 school districts with $22 million of funding for 1987-88. The gifted and talented pupils in 428 of the 1024 California public school districts comprise 5% of the statewide K-12 enrollment.

From the monumental Standford University research of Lewis Terman (1919-today) and from the practical experience of school districts throughout California, have come a wealth of insights, guidelines, and products for assuring excellence in education. But we must note that the title of this presentation contains the word, "demise" as well as "rise." Demise might seem to be too harsh a word to persons who know that only 3-5 school districts drop out of the gifted and talented program each year and that the governor did not eliminate Gate from the 1987-88. Notwithstanding these facts, current funding is inadequate. The *Gate* program is in jeopardy! I should point out that "demise" refers not only to the conceptual shell; it also refers to the substance, the essence of excellence. What we are witnessing is a lessening of uniqueness, of quality, of substance, of excellence, and of accountability.

Three interrelated factors causing the demise of gifted and talented education in California are: (1) inadequate funding, (2) loss of accountability, and (3) reductions in programming.

Funding

Recommendations based upon the legislatively financed 3-year study, "Educational Programs for Gifted Pupils," (1957-1960), —of special grouping, acceleration, and enrichment-in-regular-class programs —supported additional annual per-pupil funding of $250. Of that amount $40 was to have been used for identification, the cost of

administering of a Stanford Binet individual intelligence test and of preparing a case study. During the first 5 years of the California Gifted Program, a per pupil support level of only $40 was available for both identification and program costs. Gradually that amount increased to $100 for 1987-88.

Last year I called the Federal Reserve Bank in San Francisco and asked for the 1986 value of a 1960 dollar and learned that it was $3.69 Thus the 1987-88 additional per pupil funding of $100 per year is equivalent to only $27 in 1960 funding — at a time when the funding should have been $250 but was actually $40.

No wonder school districts with limited local resources have opted for the least expensive and often times the least adequate means of identifying and serving the gifted. Yet the Legislature in 1980 called upon school districts to expand both the identification procedures and programming, adding the program categories of creativity, leadership, and the performing and visual arts.

U.S. Census Statistics show that an eighteen year old male in 1979 would have a projected additional life income in the United States of $440,000 if he completed 5 years of university work instead of completing 4 years of high school. Because the amount would be added income, we might assume a modest 25% tax, resulting in $110,000 of additional tax revenue for the federal government.

If we divide the $110,000 by 13 years of public school, we show that the additional tax revenue is equivalent to $8,461 for each year of public school. Thus the gifted who are presumed to be the ones taking a fifth year of university work generate revenue which is twice the amount of the annual per-pupil cost of schooling. In other words, the gifted who are challenged to take graduate work, on the average, more than pay for their schooling.

Accountability

The considerable loss of accountability since 1980 is attributable to the loss of school property-tax revenue to school districts resulting from a state-wide tax reform ballot initiative. As a result of reduced funding, school districts: (1) eliminated *Gate* coordinator positions, (2) assigned *Gate* responsibilities to already overly burdened directors of special education, or (3) added duties to *Gate* coordinators. Ann Lord, an outstanding *Gate* coordinator who had an excellent multi-option program [and observation/demonstration center] for 4,000 gifted children in Fremont, California, was made the principal of two

school in addition to full-time *Gate* responsibilities . . . for identification, curriculum development, program management, inservice education, budgetary control, and involvement of parents.

In recent years I have conducted State Department of Education reviews of gifted and talented education programs and in some school districts found:

1. Invalid identification

2. Inappropriate placement of students in program options.

3. Failure to adhere to standards for assuring uniquely appropriate learning experiences to meet unmet needs.

4. Improper us of State Funds.

5. Failure to involve parents as required in planning, implementing, and evaluating gifted and talented programs.

6. Little attention to comprehensive evaluation.

Reduction in Programming

A reduction of programming is also evident. Noted especially are a reduction of program options, categories of children served, and of counseling.

Other factors contributing to the deterioration and demise of *Gate* programs are:

1. Stultifying restrictions on the leadership of State Department of Education personnel;

2. Lack of commitment by elected officials;

3. Contests for power and position by legislators, the governor, and the State Superintendent of Public instruction;

4. Suppressive attitudes and action of parents whose children were not identified as gifted and talented; and

5. Clique (small group) control of professional organizations and parent groups.

Four other factors are:

6. The syphoning off of potential funding by already overly financed, sometimes wasteful, and often unaccountable programs for the handicapped and economically disadvantaged children;

7. Failure to identify and serve the gifted and talented within the disadvantaged, handicapped, and ethnic-minority populations.

8. Professional educators who fail to support qualitatively different and uniquely appropriate education of the education of the gifted and talented; and

9. Failure of *Gate* educators to convince 95% of the population that their future, to a large extent, depends upon their supporting special learning opportunities for children whose developed analytical, innovative, and entrepreneurial talent and conceptual and technological breakthroughs will assure a growing economy and guarantee a high quality of life for all persons.

California State Department of Education (SDE) Action Contributing to the Rise and Demise of the Essence of Excellence Inherent in and Promulgated by Gifted and Talented Education:

Actions and attitudes of California State Department personnel have contributed both to the rise and to the demise of gifted and talented programs in California.

In 1961, State Superintendent of Public Instruction, Dr. Roy Simpson published the foundational three-year research study (1957-1960) "Educational Programs for Gifted Pupils" directed by Dr. Ruth Martinson—a study which provided evidence needed to pass legislation to establish the California Mentally Gifted Minor Program (1961-1979)—and to convince legislative committees in many of the 44 states currently with gifted programs that it was in the interest of their states to support uniquely appropriate learning opportunities for gifted children.

During the tenure of Dr. Simpson's successor,, Dr. Max Rafferty, California Mentally Gifted Minor state consultants were instrumental in creating a national Council of State Directors of Programs for the Gifted and in helping to promote gifted and talented education throughout the United States. Academic excellence was applauded and furthered. A three-year U.S. Office of Education "Cooperative Research Grant" to California made it possible to develop and demonstrate the respective value of acceleration, enrichment, counseling/instructional, and special-class program options.

Before becoming Superintendent of Public Instruction, and only a few years after the start of the California Mentally Gifted Minor Program, Dr. Wilson Riles informed me that "The Day of the Gifted has passed and that it was time now for the disadvantaged." I should have challenged that statement by asking "What about the extraordinary and largely untapped pool of gifted that has yet to be identified within the disadvantaged population?" Unfortunately, Dr. Riles attention was so riveted upon bringing poor black and Hispanic chil-

dren up to average performance that little time and attention was directed to the gifted. During his tenure, we did establish procedures for overcoming discrepancies existing in ethnic group participation in the MGM program and the *Gate* program. Dr. Riles, however, bears the responsibility for not using the State Compensatory Education Plan to advance excellence for ethnic minorities and disadvantaged pupils, for the main, beyond the mean. It is interesting to note that the first year of the Compensatory Education program, that $40/gifted pupil had to suffice for both the costs of identification and additional programming.

At that time, it cost $40 to do a Standford Binet intelligence Scale and to prepare a case study. At that time the Title I Compensatory Education Program spent $150/disadvantaged child for the case study alone.

The current superintendent of public instruction, Mr. Bill Honig has pushed for quality indicators in all curriculum areas. Gifted and Talented is seen as a way of upgrading the upper 25% of the school population.

My overall impression is that California's politically motivated state superintendents of public instruction care mainly about the vote potential of 95% of the population. Little attention is given to the gifted.

California State Department of Education
Impediments to Leadership of the Gifted and Talented
Education Unit Include:

1. Eclipsing *Gate* with priorities given to ethnic minorities, to poor persons, and to mentally and physically handicapped persons.

2. Appointing *Gate* unit managers who have little or no background in Gifted and Talented Education.

3. Providing insufficient secretarial support for the consultants to do assigned responsibilities.

4. Reducing travel allotments to the point that it was impossible to provide statewide leadership; attend regional meetings; conduct inservice education; investigate complaints; and train local coordinators and program reviewers.

5. Frequently changing the location of the *Gate* unit administratively within the SDE and within buildings which house state personnel.

6. Without prior discussion, reassigning *Gate* consultants to other units in the SDE and to field work. At one time I was assigned to a field team while I was managing 2 federal projects in addition to doing my regular state work. On another occasion my secretary informed me, "By the way, you are now a migrant education consultant." Fortunately, higher officials reversed these decisions.

7. When the total Department budget was $42 million, we were told that a $400 amount was not available to mail Gifted and Talented Education applications which were needed by 428 school districts serving 220,000 gifted students in order to qualify for $21 million in state funds.

State Department of Education Support:

As a balance to comments on a stultifying bureaucracy, I should hasten to add that there are many very able and supportive persons in the state who have cooperated over the years. These persons contributed immeasurably to the rise of Gifted and Talented Education. It should be noted that the California State Department of Education provided the structure and support for the foundational 3-year study which resulted in research data needed to convince legislators to fund mentally gifted minor programs.

State-Department-of-Education officials, including Dr. Max Rafferty, made possible early trips to Washington D.C. —trips which resulted in the formation of the Council of State Directors of Programs for the Gifted and which during a 20-year period brought $1.3 million federal development funds to California. The State Department of Education served as a statewide platform for initiating new ideas.

The mantle of officialdom provided access to and acceptance by parent groups and professional organizations. It made possible the evaluation of local programs and resultant (1) adherence to standards for identifying pupils and conducting qualitatively different and uniquely appropriate gifted and talented programs (2) use of state funds for improving the teaching staff, and (3) involvement of parents in planning, implementing, and evaluation *Gate* programs.

Importantly, the Department did approve of my initiating, writing, and administering eight federal grants totaling $1.3 million. These grants were critical factors in the rise and eminence of gifted education in California. They:

1. Demonstrated, developed, and validated program options: acceleration, enrichment, special class, counseling instructional programs, and special classes;

2. Produced a state framework, 30 curriculum guides, films and filmstrips;

3. Trained 10,000 teachers through regional inservice education;

4. Established a 3-year regional resource center;

5. Integrated intellectual and creative skill development in parents, teachers, and pupils;

6. Established life-oriented counseling programs;

7. Assisted in the transition from the mentally gifted minor to the more broadly based *Gate* program;

8. Helped districts with comprehensive program development.

Regional directors of aspects of these federal projects were later fused into a SDE State Assistance Team.

Team members continue to respond to innumerable referrals for service to neighboring school districts — services which the understaffed and underbudgeted SDE Gifted and Talented Unit is unable to render.

Also, I should note that is 1971, at a crucial hearing conducted by members of the State Department of Finance, the Deputy Superintendent of Public Instruction, Dr. Tom Shellhammer, stated that the Mentally Gifted Minor Program was probably the most accountable program in the State Department of Education.

Sunsetting Gate

During the past 7 years, categorical programs (including *Gate*) were assigned dates when they would terminate (sunset) if further action were not taken by the state legislature. Presumably data would be gathered before the sunset date to either establish the need for such programs or provide reasons why they should be terminated. An independent 3-year, legislatively financed research study by the RMC Corporation (1980-1983) and the June, 1986 report to the Legislature by the Sunset Review Advisory Committee III clearly established the need for the *Gate* program. Membership of the Advisory Committee III was made up of 6 person appointed by the Governor; 3 members appointed by the Speaker of the Assembly;and 3 members appointed by the President pro Tempore of the Senate. The executive summary contains this statement:

"Once a national leader in the education of the gifted and talented, California now ranks twenty-first in its pupil expenditures among the states that offer gifted programs. The combined federal and state budget for Special Education in 1985-86 for California [for approximately 330,000 students] was $1,142,000,000.

By comparison, gifted programs [for approximately 220,000 students] receive no federal support and the total 1985-86 expenditure for *Gate* was only $20,000,000. Ninety-six districts are on the waiting list for inclusion in the program and for a portion of the allocations. Many other districts have become too discouraged to apply. This has resulted in a significant number of qualified students remaining both unidentified and unserved."

The Sunset III Advisory Committee Recommended:

1. That the *Gate* program not be terminated;
2. That it be mandated;
3. That it be fully funded;
4. That California make a commitment to regain it's national and world leadership in gifted and talented education;
5. That institutions of higher education be required to offer *Gate* related courses at the pre-service and graduate level;
6. That the State Department of Education unit be adequately staffed and funded;
7. That wherever possible, homogeneous groups for *Gate* students should be provided;
8. That research should be conducted to improve junior high school and high school *Gate* programs.

Despite laudatory findings and recommendation by RMC and the Sunset Committee, no significant leadership stance by the Governor, by the legislature, or by the Superintendent of Public Instruction assures the future and suggests steps to prevent the gradual demise of the California Gifted and Talented Education Program.

Experience has taught us that evaluation efforts initiated, supported, and carried out by established units of State Government are not always what they appear to be, that is, are not always honest means of gathering needed data for an impartial assessment. Sometime they are means of postponing necessary funding, and of destroying a program.

RECAPITULATION

Rise of Gifted and Talented Education:

The rise of gifted and talented education to an established place in California public school education is attributable to evident needs of individuals, society, to available resources for meeting needs, and to individuals and agencies, and parent and professional organizations which use these resources to achieve educational and societal objectives.

Demise of Gifted and Talented Education:

The demise of gifted and talented education is caused by:

1. A funding base that is inadequate to provide high quality, valid, and fully accountable programs;

2. Lack of experience and efficient management;

3. A sense of egalitarianism that pervades America;

4. Negative attitudes of parents whose children did not qualify for *Gate*, of certain elected officials, of regular classroom teachers, and of unsympathetic or politically oriented administrators;

5. Other priorities by legislature and state superintendents of public instruction—which divert attention and support away from the needs of the gifted and talented and away from gifted and talented education.

WHAT CAN BE DONE?

Ideas for Dealing Effectively with Factors Which Threaten Gifted and Talented Education:

First of all, a starting point certainly would be to implement each of the recommendations of the Sunset Advisor III Committee:

—Mandate Gifted and Talented Education for all of the 1024 public schools districts;

—Fully fund the program so that it can achieve its high goals and benefit individuals and society

—Require universities and four year colleges to offer related teacher pre-service and graduate courses;

—Whenever possible, provide homogeneous grouping and spe cial class options

—Conduct research on how to improve junior-high-school and high school *Gate* programs.

Second, Get Gifted Education on the agenda of:

—The U.S. Governors' annual Conference;

—The Council of Chief of State School Officers;

—Professional Associations such as: College and University Presidents, Academic Deans, School Administrators, National Educational Association, Subject-Content Associations (i.e. Social Studies), and the National Association of State Boards of Education, and

—The United States Chamber of Commerce.

Third: Establish an advocacy grid to reach all leaders and member in the Congress and state legislature — and all agencies and organizations which could further excellence in Gifted and Talented Education.

Fourth: Begin the process of reconceptualizing and re-designing Gifted Education to make it truly responsive to national and state needs and priorities and to the needs of gifted children.

Fifth: Join with other states and nations in a multi-national world effort to assure excellence in government and in the Human Condition.

These actions should: Stem the tide of deteriorating *Gate* programs. These actions should bring us together in greater understanding of and harmony with our natural world and fellow human beings.

These actions should identify and optimally develop extraordinary Human Beings. These actions should negate the demise, the cessation; they should assure the rise of the Gifted and Talented Education.

To date, the California Legislature and the Governor of California have not acted upon the findings and recommendations of the RMC 3-year study (1980-83) and of the Sunset Advisory Committee III (1986).

State support for public schools *Gate* programs is scheduled to terminate in 1988.

The Clock is Ticking!!!

'torial Note: The budget for the Gifted Program in one New England
'n our nation dropped from 600,000 in the 1988 school year to zero (0)
'89 school year.

Gifted and Talented Children in Australia: Victims of Ideology

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In 1972, the report to the United States Congress stated:

We are increasingly being stripped of the comfortable notion that a bright mind will make its own way. On the contrary, intellectual and creative talent cannot survive educational neglect and apathy (Marland, p. 1).

This was a view shared and echoed in Australia, with comments added that such talented persons are often easy to ignore or are considered a threat rather than a valuable resource.

With those words in mind, it is startling to realize beginning in 1985 that for the last two years in Australia, the gifted and talented area of education (although earlier recognized), is no longer regarded as what is termed a "Project of National Significance" for special funding from the Commonwealth Government. At a time when as a nation we are desperate for solutions to the problems which beset us, problems which can only be *solved by excellence in many forms*, our nation no longer regards the gifted as having national significance. This does not mean, however, that we have solved the problems of educational disadvantage which have motivated, and still motivate, advocates who strive to improve provisions for the gifted. Rather it is

an indication of the extent to which gifted and talented children in Australia have been sacrificed on the altar of two ideologies — *quality* and *equality*. Educational promise is unfortunately all too often built upon the fragile, shallow promises of politicians so that just when the longed for and fought for goals appear to be at last realized, all has soon proved to be illusion. This paper will attempt to trace some of the factors which have led to the present situation which is so different from that brief optimism period of four years through which we had just come and then for the last two years we have been immersed in negative debates and frustration.

Australia has passed through several phases of interest and activity in gifted education, with the last phase of interest starting to emerge in the second half of the 1970's. For the first half of the 1970's, there was considerable emphasis on the disadvantaged and the handicapped and this was accepted by the electorate as being just and equitable. However, the continuing neglect of the gifted during this time of particular positive emphasis on special education but not on the gifted and talented led to concerns being expressed as to the justice of these new funded programs in the 70's.

By 1979 growing concern was expressed by parents and teachers and by the international movement which had seen the holding of two (1975 and 1979) World Conferences and the sound formation of the World Council for Gifted and Talented Children overseeing such conferences, the Schools Commission and Educational Agency of the Commonwealth Government of Australia, was stirred to action. The Commission invited Miriam Goldberg to Australia. In 1980, they published her report on her visit, which had stimulated considerable interest and activity in gifted education. So the commission invited her to return. Also in 1980, the commission published a discussion paper, *The Education of Gifted Students* and distributed this widely for comment and reaction. Following the return visit by Dr. Goldberg who analyzed gifted education in Australia and who made some comparisons with the United States, her 1981 book on *Issues in the Education of Gifted and Talented Children in Australia and the United States*, made a major contribution to gifted education in Australia.

That same year, the Schools Commission established a special Advisory Group on the Education of Gifted and Talented Children. Later in the year, the commission organized a *1981 National Seminar*

in Melbourne at which a small group of representative people discussed major issues in gifted education. The results of this 1981 seminar was published by the commission.

In 1982, the Schools Commission established within its funding program a section termed "Projects of National Significance." This enabled a number of initiatives in gifted education to receive special grants during that year and for some years after. The following year saw a second National Seminar sponsored by the commission and then in August of that year, the *first (1982) National Conference on Gifted and Talented Children* was held in Melbourne with some financial support coming from the Commission. This conference, which drew an attendance of 450 participants from every state and territory in Australia, was to lay the foundation for a national association.

In 1984, the Schools Commission continued its encouragement of discussion and action in gifted education with a National workshop. However, it is important to note that this workshop focused on populations of gifted and talented children *with special needs*. The special groups discussed at this workshop were: low socio-economic groups, aborigines, girls, the isolated, ethnic groups, and the disabled. It is these groups which became and have remained for the most part the major areas for attention in all educational policies of the Australian Government. This is clearly reflected in the 1987 publication by the Commonwealth Schools Commission, *In the National Interest: Secondary Education and Youth Policy in Australia* in which the special groups referred to above are given recognition in the report *but the gifted and talented are not*. It would therefore seem that gifted and talented secondary students and youth are not in the Australian National Interest!

This special and narrowing focus of the Commission was becoming increasingly evident. By the end of 1984, funds requested were not made available to provide support for a second National Conference.

In October, 1985, the Senate of the Australian Government requested its Standing Committee of gifted and talented children. Unfortunately while this positive step calling for an inquiry occurred, it is also in 1985 that the Schools Commission recommended that the education of the gifted and talented should no longer be an element in the Projects of National Significance.

The Commission considers that it has achieved its original ob-
jectives of fostering and stimulating activity, debate and in-
terest in the needs of gifted and talented students. This, to-
gether with the need to address current priority areas in educa-
tion, for example, Aboriginal education, the education of girls,
participation and equity, basic learning in the junior primary
years and the education of disabled students, led the Commis-
sion to recommend that the element in the Projects of National
Significance Program for the education of the gifted and tal-
ented should be discontinued after 1985. (Schools Commission,
July 1986, p. 4).

It is important to understand the extent of funding for gifted and
talented projects for one year under this scheme. A total of
$1,372,744 was expended on Projects of National Significance and of
this amount, a total of $74,359 was allocated to projects for the
gifted and talented. For only a four year period, during which the
gifted were deemed to be of national significance and were funded,
the total spent on this area was $400,000.

It would seem (and it certainly seemed to us at that time) that this
initial legislative direction was intended to be a more permanent mat-
ter (than only for four years) than the Commission now considers it
to be. The Schools Commission is a Government body and it is re-
sponsive to the ideological stances of whatever political party holds
power. It is clear from the recent reports and the actions of both the
commission and the Government that the gifted have returned to that
state of disfavor from which they had but recently emerged.

However, there was a widespread belief that gifted programs
were undemocratic and resulted in special consideration for an
elite group, one that was already advantaged. This egalitarian
outlook was reflected in the generally negative stance of
teachers, administrators and the community to the education of
gifted children (Bragett, 1985a, p. 33).

This view is reflected in Goldberg's earlier analysis of provisions
for the gifted. Indeed, Goldberg titled an important section of her
report, "Egalitarianism and Excellence—Ambivalent Attitudes". In
this section, Goldberg notes that in her first visit the major concern
she encountered was "a variously articulated fear that special atten-
tion to the gifted represents a form of elitism" (Goldberg, 1981, p.
8). On her return visit, Goldberg found the same problem for "Even

currently, despite increased efforts on behalf of educating gifted/talented students, the specter of elitism continues to haunt Australian educators" (Goldberg, 1981, p. 10). Goldberg observed that this fear of elitism did not exist in the talented in music, dance or drama but seemed to be focused on particular forms of giftedness—namely on intellectually or academically gifted. An Australian leader wrote that:

> Special provision for intellectually talented children is clearly contentious...(Beazley, 1984, p. 313).

Why is there this concern that special provision for the gifted will be elitist, undemocratic, unegalitarian? Does the concern stem from our national roots as some writers would suggest? Russell Ward in his study, *The Australian Legend* considers this egalitarian attitude to be an important part of the Australian national character and links in back to various stages in the colonization and development of Australia. He sees egalitarianism being partly a product of the convict system. He also sees egalitarianism reflected in the attitudes of the colonial working man, of the workers on the outback properties, and of the diggers on the gold-fields where "the diggings were also a forcing-ground for two other traits already noted as being typical of the outback Australian way of life: adaptability and egalitarian independence" (Ward, 1958, p. 41).

Of the bushmen or farmers of the later stages of national development, Ward claimed that they exhibited "perhaps more manly clearly than his forerunners that manly independence whose obverse side was a levelling, egalitarian collectivism" (Ward, 1958, p. 180).

For White, (1951, p. 76), this national character is a myth created by an interpretation of Australian history to reinforce and develop a view that was extremely important forth ideology of the Left.

Whatever the reality in terms of whether or not there is a typical Australian and whether or not that typical Australian is one who holds an egalitarian view of society, the goals of the gifted and talented certainly provoke opposition to the firmly based egalitarian views of education.

By 1984, an important shift was occurring in the Commission's thinking toward the broadening of the concept of giftedness, an idea gaining popularity in Australia.

Proponents of this expanded approach refer to the notion of gifts and talents, calling on teachers to foster all gifts and talents to poten-

tial level. This democratic ideal is somewhat akin to providing for an extended range of individual differences in the classroom and to nurturing any display of excellence within a supportive environment (Braggett, 1985b, p. 2).

The statement is important because it contains those key phrases such as "democratic ideal" and "excellence." It his here we find an important reference to gifts and talents rather than to the gifted and talented. Braggett (1985b, p. 9) justifies the use of "gifts and talents" on the grounds that "Australian educators . . . are more likely to accept the notion of gifts and talents in many children rather than giftedness per se." Later he suggests that "It would appear desirable to drop the gifted tag and to stress the cultivation of excellence" (Braggett, 1985b, p. 17). Subsequent reports on excellence in education indicate that when that term is used, the gifted are ignored and the shift has been to equality of opportunity and to equality of outcomes!

This trend is disturbing because it reflects the extent to which the gifted movement had come full circle. The task of catering for the gifted, which was difficult enough when the group to which the term was applied was small, is now increased dramatically to include all children. It can only then be expected that the teacher will "try" to foster these gifts and talents. Perhaps when the task proves once again too overwhelming, another phase of enthusiasm for the gifted will begin.

The principle of equality of opportunity is that young people should have equal opportunities to develop their full intellectual, physical and aesthetic potentials and to participate in the economic and social life of the nation regardless of the circumstances. It has been argued, education should contribute to equalizing such outcomes across groups of people (Schools Commission, April, 1984, p. 117).

A commitment to equity places a particular responsibility on the commonwealth to protect *the entitlement* of children across the nation *to a quality education . . .* particulary in relation to students from groups least able to defend their own interest. Of course, the groups referred to are the isolated, the aborigines, girls, the disabled, the poor, and ethnic groups but not the gifted.

In this egalitarian view of the world, the gifted are regarded as being able to defend themselves and argue their case because they are

an advantaged group and when governments and their commissions hold such a view, the cause of the gifted suffers.

It is in the 1987 document, *In the National Interest: Secondary and Youth Policy in Education*, that *equity and excellence* are clarified as Government and Commission terms. Noting various criticisms of the *concept of "equality of opportunity"*, the report states:

> Criticisms of this kind led to a new approach to education and equality emphasizing not just access and opportunity but success, as measured by outcomes. It emphasized the idea of distributing success more equally in schools. It followed that public authorities should, where necessary, allocate resources and effort to reduce inequalities in achievements and outcomes . . . instead of focusing exclusively on work tasks which differentiate between students and emphasize their differences.

A statement such as this argues against a differentiated curriculum for the gifted and denies the difference, that is, giftedness, which requires a differentiated education provision.

In the submission, the Commission correctly points to its role in the broadening of the concept of giftedness and then states that "It supports the growing acceptance of specific giftedness, rather than a unitary notion" (Schools Commission, July, 1986, p. 1). The statement or slogan that "Every child is gifted" is a warm compassionate view of the child whereby every child has the ability or the potential to perform some particular thing better than the child can typically perform other tasks. The statement is nonetheless a comforting one to those who which to challenge the needs of gifted education on egalitarian grounds.

The familiar themes are clear and from this the Commission argues that because "there is considerable unrealized potential among groups of students traditionally regarded as less likely to be considered gifted or talented." The solution proposed should not be unexpected in the light of the earlier discussion of official policy documents. High priority in the pursuit of excellence and quality in education for all students must be given to bring about the achievement of equality of access to education and of equality of its outcomes.

The Commission in a later section of its submission endorses a mainstreaming policy for the gifted and therefore does not "support

measures to segregate thee students in special classes or institutions"
(p. 5).

> The Commission is firmly of the view that it is highly desirable
> that provisions for gifted and talented students should be inte-
> grated into mainstream education for reasons related to equity,
> quality and the pursuit of excellence in education, as a means
> of ensuring that all gifted and talented students have access to
> appropriate curriculum, teaching methods and school struc-
> tures, and to avoid bias on the grounds of socio-economic, cul-
> tural and gender differences in the identification of students (p.
> 7).

The tensions between equality of opportunity and equality of out-
come, on the one hand, and between quality and excellence in educa-
tion, on the other, continue to be found in the various documents
which have revealed government policy. The policy of quality and
equity is, however, interpreted from an egalitarian view of Australian
society. It is an odd development that after years of endeavour by ad-
vocates of the gifted in overcoming the unacceptability of giftedness,
in Australia now at least, it has become such an acceptable character-
istic that everyone has it!

The way ahead in Australia will not be easy. Advocates for the
gifted must combat an ideological position which is determined to
bring to reality the egalitarian society that is purported to exist
already. It will be difficult and painful but unless present policies are
challenged, gifted children in Australia will continue to receive edu-
cational opportunities which are less than their right. They will re-
main, as they are now, victims of two or more types of ideologies, as
described above, which conflict with the concepts and literature of
the gifted. (The reader desiring more detailed information should
write the author for his much longer and very scholarly initial report
submitted for this conference.)

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Is High Intelligence a Valid Reason For Depriving the Deprived?

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A child's achievement, even development, derives from at least four sources—the child, the home, the school and the society. One might well ask what are the contributions and relative importance of these four. For the arguments in this paper it is not necessary to know the details or comparative contributions of the child, home, school and society. It is only necessary to recognize that they can and do contribute to a child's intellectual development.

While investigating this total area and its four broad components, we realize that the full development of the child is not a very well researched area. We would, of course, have preferred to have had available considerably more sound data upon which to base our direction

The Roles of Schools

The vast difference between the roles of schools in the past and present is that with compulsory, mass education the whole range of variability in the children of the community now faces the schools and has to be considered in the teaching approaches and the nature of the schooling.

If the ability scores are cast in the form of age equivalents, they thereby enter teachers' awareness. A class of twelve year olds are typically functioning between 9.5 year old and 15.5 year old norms. Such a class of twelve year olds achieves as though it were comprised of children whose ages differed by six years or more.

Greater acceptance and comfort may be found by using classroom achievement scores. Then the range of achievement appears even larger than the range of ability, so the range of achievement will increase to eight years or more.

Hunt et al. (1972) compared high and low ability college students who would be equivalent to the high and average ability groups in the population cohort. Not only did the able students process information faster but as the complexity and quantity of information increased, the gap between the high and the average groups *increased*. The high ability group also was much more efficient and faster in decoding and understanding sentences—a superiority which increased further with an increase in the complexity of the sentences. Failure to present complex, demanding tasks may lead to failure to identify our gifted and talented children.

Things that are happening all around us in the environment can collectively be termed "information processing." Research in the USA indicates that children vary in this capacity by at least a factor of four (Jensen, 1963; Sen et al., 1983; Cohn et al., 1985).

Another view is that Royer et al. (1978) looked at the retention of a set of scientific concepts by three groups of high, average and low ability grade 9 children. One month after first learning the set of concepts, the percentages of retention of the three groups of high, average and low ability were, respectively, 73%, 51%, and 25% (a ratio of about 3:2:1). Klausmeier and Feldhusen (1959) had previously reported on the retention of mathematics learning which indicated that high ability children retain a learned difficult task as easily as low ability retain a learned simple task. *Whom then do we teach*?

Despite all the best efforts of teachers, a small percentage of the children in a class do not learn the material with which they are presented. The percentage of non-learners varies across subject and from day-to-day—and the same children are not always among the non-learners However when pressed, most teachers recognize that somewhat less than 90% of children learn the specific material in the way it is taught and at the speed it is taught.

Lundgren, from Sweden, found that teachers seem to have a sym-biosis with a group of children between the 10th and 25th percentile in the class. This group ''steers'' the teacher's teaching to be correct for it. If all the ''steering group'' learns, then 90% of the children in the class will learn. If the teacher inadvertently teaches the material so that it is just beyond the reach of the ceiling of the steering group, then only 75% of the class will learn. However, in the latter case, the feedback from the ''steering group'' would be such that the teacher would reduce the demand of the next unit of work so that it falls within the compass of the steering group—they act like control tabs on the teacher's teaching.

It turns out that lessons are pitched so that the steering group can learn them. The top half of the class could learn the material in 2/3rds of the time, and the top quarter in half the time. Differences in learning speed is certainly not everything, but we do appear to teach as though it were nothing.

While there may well be some classrooms attempts at catering for ''individual differences,'' those attempts have little to offer the able child, let alone the gifted and talented. Why are such attempts essen-tially cosmetic?

In considering teacher education, we realize that a teacher cannot use knowledge or skill she does not possess. To be able to begin to cater for gifted children, the teaching force must have the appro-priate background and, ideally, training. What appropriate training is available.? One finds staggeringly little.

The 130 + child occurs as 2.28% of her age cohort. She is one in 44 children. She is, in most schools, to be found in every grade some-where. Every secondary teacher will probably meet such a child every day and every primary teacher has the probability of finding one such child in her class every two years. Knowledge about these children should be part of every teacher's training, which is far from being the case. Relevant course offerings are almost rare and most were selec-tive, not compulsory (Start, 1985).

A small minority (almost 10%) of institutions offered a full pro-gramme on gifted children and in none of these was that programme compulsory. In comparison, practically every institution offered something mostly mandatory, on the child with some form of handicap—be it intellectual, social or economic. For every hour of tuition on the gifted child, there were between 15 and 20 hours on the handicapped child. Those in charge of preparing teachers had made a

policy decision that teachers are to know about the typical child and the handicapped child but not about the able or the gifted and talented.

It is little wonder that teachers know so little about gifted and talented children. Such ignorance cannot lead to confidence in teaching such a child. Uncertainty soon leads to feelings of professional inadequacy and frustration, to feelings of threat, to resentment and even to fear.

Beyond learning what is presented for 80-90% of children, the able child's full development is to be left to others — if whoever the others are, ever want to do anything about it. The teacher, ergo the school, opts out. This "decision" by the teacher (and the school) is rarely made consciously.

The administration of the classroom, the school, the education system is not geared to differential learning. To meet the individual needs of children would devastate the adminstration, so the teacher works to save the system for those who operate and administer the system.

The arguments of equality would be impressed on the teacher by those whose commitment to their own ideology is greater than their commitment to facts or to the children. Pedagogical statements, such as "They learn anyway", are designed to justify a position and such statements bear little relation to the empirical facts available from research studied overseas (e.g. Duncan & Dreger, 1978) and more recently those of Betty Murphy in Melbourne (Murphy 1985a, 1985b).

So the schools are not structured to permit the gifted and talented child to develop fully. Neither is the curriculum nor the teacher's professional education. Educational policy seemingly at all levels appears to regard "undemocratic" to be in some way catering for the needs of the gifted and talented child. So the formal educational system, policy, school and teacher all opt out from the task of ensuring the full development of the gifted and talented child.

The gifted and talented child has three of the four sources of her development left: herself, her home and her society.

Possible Roles of the Child Herself

When the school opts out, the gifted and talented child can fall back on her own resources. Whenever she (quickly) finishes the education presented by the school, she can educate herself. She can also

ask the teacher questions to satisfy her curiosity — until she buries the teacher with her questions and is told to back off.

She can read the text book — if one exists — that occupies her, for a while. She finds however that getting too far ahead gets her into as much trouble as asking too many questions.

She can find something else to do. She will equally and that the teacher likes her to do what is set for the class, not anything else, either beyond or outside of it. She can think high thoughts — only to be accused of daydreaming. Unless she is careful, she may be given a plethora of tasks to fill the time, but gradually she finds that most are boring. So why would she want to learn everything well when it gets her into trouble? Why not reduce effort which will actually please her teacher because she is "occupied" and causing less trouble.

An alternate possibility is that she might resent being frustrated in her learning, which might be taken out on the teacher, or on other children or even on herself. Now she no longer has a problem — she is the problem.

Hughes and Converse (1962) alert us to the gifted and talented children who become hostile and negative to school. They tend to develop poor study habits, have relatively low achievement and emerge with personal problems. An indirect effect of this is that these maladjusted children would not be recognized as being gifted and talented by most teachers and by many identification techniques.

The Role of the Home

If we take intellectual capacity or achievement as the form of giftedness for our exemplar, then we can identify two issues. The *first* is that by selecting the group of children to comprise the intellectually gifted children only, the range of potential within that group is significantly reduced. Yet these gifted and talented children come from all kinds of homes.

That is the second point. No social class, no ethnic background, no particular gender has a monopoly on gifted and talented children, or is free of them. Such children are to be found in homes which stretch from one extreme to the other and from every level of parental concern for children or education. Hence the variance of the homes of gifted children can be as great as that in the population of homes at large.

Gifted children occur in "good" homes and "bad" homes by whatever criteria "good/bad" are defined. They are in homes with

and without "resources", however you choose to define "resource". Gifted children occur in homes where the parents have extensive or minimal "education," however you define "education." They are in homes with positive and negative attitudes toward education and to children, whatever "attitudes toward education" may be perceived to be.

Hence if the child's intellectual development is thrown back to the contribution of the home, there is a vast variability possible in that contribution. But it is well know that the learning of children of any ability is enhanced if the child comes from a home which might be described as "good", with "resources," where the parents are educated, and have favorable "attitudes" toward both education and children. Such a home can offer a rich domestic learning environment. It will "pull the stops out" and take steps to offset lack of intellectual stimulation at school. These homes might well be regarded as "advantaged" and the children in them, "advantaged". Such an "advantaged" gifted child would be less disadvantaged or deprived by a school policy not favorable to extend to her development.

On the other hand is the gifted child whose full intellectual development comes to be almost entirely dependent on the home which lacks supportive resources: be they attitudinal, economic, educational or material. Hence, the gifted and talented child from the disadvantaged home is most deprived by her school not having a sound policy, a responsibility, to maximize her intellectual potentials. Those from the disadvantaged and deprived backgrounds suffer most, in some instances even to the point of extinction of that gift or talent. There is little that her home can or will do to compensate for what the education system will not provide.

A higher percentage of working class compared with upper class gifted and talented children have lower levels of social and moral behavior and more adjustment problems. These include fundamental differences between children and their parents on such issues as values and ability. Without school support, students from disadvantaged homes have their problems from home become focal.

The Role of Society

Society can be defined in many ways, some of which include more specific statements about social policy of governments and of groups, such as educators within the population. In 1960, Bill Radford alerted Australia that society gains in the long term from educa-

tional programmes which maximize the intellectual development of gifted and talented children. Radford felt that all children had the same right to an education which would develop and extend their ability — a right which extends to the fast learners as well as to the slow and average learner.

Kim Beazley later enshrined the needs and rights of gifted and talented children in Section 13 of the Act which established the Australian Schools Commission in 1973. He commented that such children had the right to full intellectual development as a mark of grace and favor due to every child (Beazley, 1985). However he admitted that by 1983 little was being done for the talented.

For some reason, developed Western societies are reluctant to enhance potential talent. Australia has a reputation of being more concerned with the underdog, the battler, the disadvantaged and the deprived. More recently Australia has become obsessed with equality, egalitarianism, consensus and co-operation. In education at least, we disdain competition and deny individual differences by seeing them as reflections of an unjust society and as needing elimination. We seem to have swung widely from one extreme to another.

At the current time, in the name of social justice and equality, the educational system — schools and teachers — follows a policy of doing little or nothing to extend the development of the gifted and talented child within mainstream curricula. With that policy of inaction, we actually increase social injustice and inequality. In disadvantaging all members of that group, the policy ensures that children from advantaged homes will be deprived least and those from disadvantaged homes deprived most, if not eliminated. Those children in disadvantaged homes generally do not *emerge*, for they have been *submerged* by the further disadvantage of school indifference to their needs.

When the implication of this policy is appreciated, it is easy to see some truth in the opponents' statements that gifted and talented children are to be found in middle class, educated, ergo advantaged homes. The homes of these children can offset to some extent the lack of school interest in them.

In the name of equality and social justice we do little, and effectively nothing within the structure of formal education, to develop the gifted and talented child. Because this policy forces the child back on the resources of her home, the brunt of this non-development is born by the child from the disadvantaged home — the home disad-

vantaged because of economic, social, educational, attitudinal and/or cultural features. *Thus in the name of equality, we increase the inequality.* In the name of social justice we increase injustice. The policy is not only ineffective, it is counter-productive.

When the disadvantaged, the deprived, the minority groups, the aboriginal people and whom overall realize this, we might see pressure from them to correct this situation. As long as they believe the myth that gifted and talented children come only from middle class anglo-saxon homes, then the totality of very able children will not be developed fully.

Bernard Gifford, the black American Dean of Education at the University of California's Berkeley campus points out:

> "Public schools are in deep trouble . . . our public schools will soon become the equivalent of public housing projects. They will become places where we shove the poor, the disinherited, and those with no other choice...place dominated by one class in our society—the poor". (Harrington, 1985 p. 11)

Those who govern Australia overall should balance their education policy of blocking the most able children, against the fact that our competitors in South East Asia (Phua, 1983; Ministry of Education 1985); in parts of Europe (e.g., Spain); throughout Eastern Europe; and increasingly in China; are doing the very opposite. Around the world, countries are honing the talents of their youth, while we, particularly in Australia, stultify ours. We can expect little quarter politically, economically or socially overseas because of our deliberate process of blocking the development of those most able in our next generation.

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Is "Gifted Education" Really Elitist?

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Several weeks ago I attended a university-sponsored social activity with colleagues from various academic departments. During the course of the activities one of my closer colleagues convinced by to be his partner in one of the more popular games played at affairs attended by academicians. Actually, this game is nameless, but it could adequately be dubbed as "cross disciplinary ragging," or better yet, "protect your own turf by attacking another's." I've played this game many times before. For example, in philosophical circles (gatherings, no arguments), it is not uncommon to "rag psychology." It is also not to difficult to win at that game—psychology seems so defenseless to so many attacks. But at this particular party the turf (field/discipline) that was to be attacked was "gifted education."

There are some standard strategies employed by the "attackers" of gifted education, the most common of which is to charge the "educators of the gifted" with elitism. As a self-avowed, avid advocate of egalitarianism, I found no real difficulty in joining forces with my anti-elitist colleague. After all, there is an astronomical amount of ammunition in the arsenal of the anti-elitists. Our initial move was to dip into this arsenal and use some of the most potent ammunition available in order to establish the validity of our charge. By referring

to the Bowles and Gintis publication, *Schooling in Capitalist America*, with its enormous amount of factual data, it was possible to demonstrate quite clearly that the American educational system is designed to reproduce the already existing inequalities within the American society. And, then, to make certain that this charge is damaging (if not killing) to the proponents of "gifted education," we referred to Jennie Oakes's recent book, *Keeping Track*, to demonstrate that the system of grouping students for instruction on the basis of ability reflects and perpetuates the class and racial inequalities of the American society. Accordingly, we concluded that "tracking" is anti-egalitarian, i.e., elitist and that it is one of the greatest malpractice (albeit an unintentional one) of the American educational system.

Anyone who has ever played this game knows that the initial intellectual move is important for one's position throughout the remainder of the game. In fact, it is so important that this move could be the determining factor between winning and losing the game. We felt very comfortable with our present position; we thought we were ahead. For instance, who could possibly refute all the empirical evidence cited by Bowles and Gintis and by Oakes? No one! But, just as we were smugly basking in the glory of seeming victory, I was suddenly stricken with a shocking sensation. It was an uncomfortable feeling, one I sensed to be somewhat analogous to the insecurity felt by the social scientist who attempts to defend the scientific nature of his/her discipline by appealing to and utilizing methods that are essentially nonscientific. My partner and I were also using descriptive criteria, e.g., empirical data taken from *Schooling in Capitalist America* and *Keeping Track* to derive a prescriptive conclusion. We were not (nor was my imaginary social scientist) being unfair — all is fair in love and war — and "academic ragging"! However, both of our positions were untenable because we were begging the question. We had committed what in philosophical circles (arguments, no gatherings) is considered to be the unpardonable sin of invoking a "petitio principii" — the fallacy of assuming what you are supposed to be proving. Our conclusions, therefore, resembled ontology without logic.

This fallacious line of reasoning was not the only logical problem my partner and I encountered during the game. We were claiming to be egalitarians, persons committed to the principle of equality, and it followed from our egalitarian position that we were anti-elitist. It was supposed to follow from that anti-elitist position that we were op-

posed to "gifted education" because it provided "special" treatment to a "special" group of students. However, for this last conclusion to follow necessarily it would have to be the case that those of us who are committed to the *principal* of equality are also committed to some empirical generalization about the nature of man, e.g., that all men are equal.

Admittedly, it sounds rather cryptic to assert that "equals should be treated equally" and "unequals should be treated unequally," at least not until it is further explained that the initial prescription refers to treatment within a category and the latter refers to treatment between/among categories. I urged my cynical *ex*-partner to consider the following example: all children who are within the category of "mentally deficient" ought to be treated the same, and they, as a special category, ought be treated differently from all children within the category of "mentally gifted." In essence, the initial prescription amounts to saying that "all men ought to be treated the same" and with no exceptions, unless, of course, a category of exception is created.

The second prescription advises us that there should be reasonable grounds for placing people in different categories and that these different categories deserve different treatment. Injustice results just as much, Aristotle pointed out, from treating "unequals equally" as it does from treating "equals unequally."

My partner surrendered to me, and we, in turn, surrendered to the educators of the gifted. Despite our loss, we had gained a clearer conception of equality. We learned that it is implicit in the concept of equality that equals be treated the same, and also, that when relevant differences exist among men, they be treated in relevantly different ways. We concluded, on the basis of this conceptual clarification, that special programs in schools for relevantly different students, e.g., differential education for the gifted, are ramifications of the conceptual implications of equality and are, therefore, *not* elitist. Finally, we are reminded by Aristotle that the principle of distributive justice is an implicit part of the concept of equality. And, therein lies, we realized, the justification for differential educational programs for the gifted.

Dynamics of Ideological Disparity

A Study of Conflicting Viewpoints and Their Deleterious Consequences for the Theory and Practice of Differential Education for the Gifted (DEG)

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The thesis of this presentation is that, over and beyond those differences in concept and practical usage which make for allowable and interesting variation, and for growth in any field of educational endeavor, contemporary thoughts (language, logic) in Differential Education for the Gifted (DEG) is fraught with essentially incompatible or disparate ideologies and heedlessly competing theories and systems. This fact constitutes a condition deleterious to the movement, now internationally active, toward positively extraordinary education for youth with positively extraordinary potentialities for learning and socially contributory service. Theorists and practitioners alike, therefore, stand in want of commonly acceptable, integrative conceptual foundations and criterial referents; and accordingly can but engage, and all too often unwittingly so, in contradictory combinations of thought and practice which at their worst prevent and deny, rather than advance the anticipated purposes.

Proposition 1: The Existence of a Conceptual Prototype

That shortly upon the turn of the present century, purposive, pioneer inquiry in American science and education as to (a) the nature of giftedness (Terman), and initial explorations as to (b) the potentiality of curricular modifications (Hollingworth) for youth at the positive extremities of measured intelligence, comprise an evidentiary basis

(i.e., Terman's factual prolegomenon) for the still necessary derivation of a functionally applicable theory of developmental education (life span) for this positively exceptional population; and that in the early 1950's, such a theory, in rudimentary form and essence, was in fact constructed (Ward, 1952), since designated as Differential Education for the Gifted (DEG), under the logic that DEG is the extraordinary education of extraordinary persons for the anticipated performance, not of the simpler function of participation within existing human culture, but rather for the more complex and extraordinary role of sociocultural reconstruction.

Proposition 2: The Existence of Ideological Disparity

That ideational or substantive deviations from this established prototypic conception (DEG) have emerged, mainly within the past decade or thereabouts (1970s to date), frequently heralding as "models" or "systems" of education for the gifted, and/or the talented and/or the creative (thus G/T/C/E), few if any of which emergent constructions satisfactorily meet the criterial requirements for philosophic or scientific theory and thereby must be viewed variously as ad hoc position statements, doctrinaire propositions and the like, more in the nature of ideologies that of proper theories; and that in main effect these aberrant, quasitheoretic propositions—though often appealing to practitioners too many of whom eschew the complex and too few of whom discriminate between the warranted and the unwarranted abstraction—are as to intrinsic character arbitrary postulations, each by fit its own ikon, and accordingly each essentially dissociated from and at points irreconcilable with others purporting to be and do the same thing, such that in the end ideology appears virtually to have replaced generic theory (this author's or any other) in Differential Education for the Gifted.

Proposition 3: The Consequence of Ideology Over Theory

That inherent within this emergent condition of rational and scientific anomie (meaninglessness, disorientation), wherein theory is effectively displaced with ideology (a-theoretic, quasi-theoretic and otherwise criterially insufficient and doctrinaire postulations), are certain signal consequences which threaten the integrity of the cause (justifiable and effortful intent), its sociopolitical viability and its economic bases, such that dynamically, while ostensibly enjoying un-

precedented prosperity and expansion, we are in fact and in practical effect suffering near denouement or potential extinction; and that this unconscionable state of historic misdirection and functional disruption will likely continue and to worsen until deliberate and effectual efforts are made to restore philosophic, scientific and theoretic integrity to the inordinately consequential field, and thus set it back on course with its own notable history and conceptual legacy.[1]

Conclusion

Thus in a three-fold exposition the "dynamics of ideological disparity" are revealed to be or to involve (a) the evolution of a constructive and productive theoretic prototype; (b) the emergence of a counterproductive body of thought and action more nearly doctrinaire and ideological than theoretic; and (c) resultants of which degenerative state of affairs, being signal changes in status (near denouement) which urge conscious and effortful initiatives toward the restoration of integrity to the field.

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1. Cf. Ward, 1987, in forthcoming Newsletter, Gifted Education Press.

Three American and Chinese Studies of Parental Relations with Gifted & Normal Boys & Girls

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Connecting Giftedness to Parental Influence
J. R. Campbell & Jeanne Pizzo

This paper describes a study of the influence exerted by *American parents* on gifted and non-gifted fifth- and sixth-grade children. Do American parents socialize the gifted differently than the non-gifted? Are girls (both gifted and non-gifted) socialized differently than boys?

In order to answer these questions, 279 gifted and 408 gifted children were tested with the Inventory of Parental Influence. This instrument isolates the children's perceptions of five parental factors: parental pressure, psychological support, press for intellectual development, parental help and monitoring/time management.

A multiple *D*iscriminant *A*nalysis (DA) was performed to isolate the combination of variables that separated the following four groups: gifted males, gifted females, non-gifted males, non-gifted females.

The DA isolated one discriminant function that contained high levels of *parental pressure, monitoring,* and *parental help.* This function accounted for 77% of the variance and was named "*Intervention*" because parents that use these types of influence try to actively intervene in their child's education. Both non-gifted groups scored

high on this function while both gifted groups had negative values. The parents of the gifted employed a more passive form of intervention where little pressure was applied and low levels of help and monitoring were used. In terms of socialization, both groups of boys were given higher levels of intervention. The authors concluded that parents play a major role in socializing girls away from technical areas.

Chinese Show The Way To Gender Equity
J. R. Campbell & R. J. Wu

This article describes a study of the influence exerted by Chinese parents on gifted and non-gifted fifth-and sixth-grade children in the Republic of China (ROC). Do the Chinese socialize their daughters, especially the gifted girls away from the technical areas the same way that Americans do?

In order to answer this question, 492 gifted and 1071 non-gifted children provided information about parental practices along five dimensions: parental pressure, psychological support, press for intellectual development, parental help, and monitoring. A multiple discriminant analysis was performed to isolate the combination of variables that separated the four groups (gifted males, gifted females, non-gifted males, non-gifted females).

The results of the study showed that the gifted get much more autonomy from their parents (both boys and girls). This strategy stresses the development of internal motivation. The parents of the non-gifted were found to utilize a much more *punitive* approach that depended upon external forms of motivation.

The study also found that boys (both gifted and non-gifted) received a more active form of parental intervention than girls. Girls received a more passive approach. For the gifted girls, their parents gave them high levels of autonomy with passive levels of intervention. This optimal combination of parental influences allows bright females in China to pursue a broader range of careers than American females.

Chinese Parents Treat the Gifted Differently
J. R. Campbell & R. J. Wu

This study isolated gifted children in nine elementary school and compared *Chinese parental influence* with normal children in the same schools. Our specific questions were:

1. Do gifted boys and girls receive higher levels of parental pressure than normal boys and girls.

2. Do the gifted receive the same levels of psychological support as normal children?

3. Do gifted boys and girls receive more help at home than normal children?

4. Do the gifted get more of a Press for Intellectual Development?

5. Are gifted students monitored more than normal children?

The objective of this study was to see if parents of gifted and normal children all utilize the same socio-psychological forces in raising their children. Does the same inequity cycles exist for each group? We limited our study to the parents' influence because Mayeske, Okada, Beaton, and Wisler (1973) and Marjorbanks (1979, 1981, 1982, 1983, 1985) showed that *the total home environment contributes much more to children's achievement in school than all of the school/teacher variables.*

The data for the study were derived from 492 gifted and 1071 normal 5th and 6th grade children attending public schools in Taipei, Taiwan (ROC). The gifted were the top 3% of the student population. Six of the schools placed these gifted students in homogeneous classes and three schools had pull-out programs. The post hoc tests uncovered significant differences among the groups for all of the seven demographic variables.

The final set of demographic variables involved the parents' education. The fathers and mothers of the gifted had significantly higher levels of education than the parents of the non-gifted groups.

Parental Influence Factors

The parental influence factors uncover several interesting findings. Within both sets, boys received more pressure than girls, but gifted girls received the least pressure—significantly less than the other three groups. Non-gifted boys received the most pressure, even significantly more than the gifted boys. There were important contrasts in the help given by the parents. Both groups of males received more help than the females with the gifted males receiving the most help—significantly more than both non-gifted groups. Gifted females received significantly more help than non-gifted females.

We named this function a *Press for Autonomy* because the mix of variables suggest that educated parents administer very little pressure

but emphasize reading and the use of the library. They also offer small amounts of help where it is needed. All of these variables suggest the development of the students' *Autonomy*.

The second function had loadings on educated fathers together with high levels of pressure and help. We named this function *Intervention*. For this set of variables the parents actively intervene at one extreme or are passively inactive at the other extreme. this function separated the boys from the girls with the boys getting an active *Intervention* and the girls a much more passive approach. The gifted boys received the most *Intervention* and the gifted girls were at the passive end of the continuum.

The gifted get very different kind of influence than normal children. Their parents use very low levels of pressure which indicates that they are aware of the dangers of punitive strategies. These parents have also made the connection between extensive reading and the part that reading plays in learning. Their intermittent help supplies the last element of this approach. This receipt of parental influences is the ideal combination of these variables. It shows that the parents of the gifted in Taiwan use a very sophisticated approach to their children's educational careers. It is a long range view where the children's natural interests are nurtured so that healthy life-long learning attitudes can be developed. We have not found the parents of the American gifted to use such an approach. However, the Americans do use the combination of parental variables. This is much more direct and punitive. In our American studies we have found that this direct approach can backfire and result in lower levels of achievement. Psychologists have known that negative reinforcement is a risky strategy to use. Positive reinforcement has been found to be a much more productive method.

The second day question concerned the gender differences among the samples. The press for Autonomy and Intervention indicate that the Taiwan parents do modify their parental strategies for boys and girls. The fact that the boys get a more active Intervention would indicate that parents see their educational careers as more important than for girls. However, the fact that gifted girls received more of a Press for Autonomy would provide them with the internal motivation that is needed to break any gender-inequity cycle.

Our data therefore leads us to conclude that the Chinese gifted females seem to have a better chance of doing well in technical academic areas like science and math. The passive approach that girls

receive has been shown to enhance achievement in our American studies. Consequently, we would predict that much higher percentages of such gifted females would enter the technical fields as they reach college.

We also feel that the Americans can learn a good deal from these Chinese parents. Their use of optimal combinations of parental influence could serve as models for American parents. Finally, this international study demonstrates the potential of cross-cultural studies. No one nation has a monopoly on good ideas. However, the future might well belong to nations that can translate each others good ideas into practice.

Gifted Boys
and Their Fathers

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The bulk of research on families and parents of the gifted has been retrospective, limited by what documentations are available and lacking adequate control measures. This study is an attempt to respond to a growing need, as Stein (1984) claims, for studying the parents of "muses", not merely in order to gain a historical perspective about the lives of the gifted, but, also, in order to understand these people, to enrich their present content and to help plan their future.

Our clinical impressions (Gelcer, 1987) gained from doing family therapy with 20 families of gifted children, so far corroborated Fell et al (1984) findings that parents of gifted children are themselves exceptionally intelligent, more assertive and persistent than the average parents of children in families seen in our Clinic. Furthermore, the process of work with parents of gifted underachievers, with their relatives and other extended family members not only reveals parallels in the parent-child relation between past upbringing experiences and present parenting skills but has also shown, repeatedly, that grandparents-grandchildren relations in these families are unusually strained. When we zeroed in on parenting styles, we noted that the father-son relationship, in the nuclear family, as well as in the family

of origin was devoid of spontaneity and warmth. This relationship was rigidly programmed and conditional on the son's accomplishments—whether academic or social—leaving both father and son feeling isolated, embittered and depleted of mutual support and nurturance. Both father and son seemed to portray the personal makeup of the all-round underachiever.

In subjecting our clinical impressions to an experimental paradigm, we took an unusual step in the direction of studying the gifted child's family. We hypothesized a) that fathers of gifted underachieving children will experience and report more problems in their families than do mothers; b) when rating their own behaviour in their families, these fathers will also delineate more problems specific to their roles as husbands and fathers and, c) in the total analysis, parents of gifted underachievers can be interpreted to be underachievers themselves, in the domain of family life.

Thus, forty-nine intact couples, parents of boys aged 8 to 12 years were grouped into a 2 x 2 experimental design, as follows: two groups of parental couples, each having a gifted son: N = 29 and two groups of parents, each with a son identified as of average intelligence: N = 20. They were also classified according to their son's academic achievement or underachievement respectively, as: gifted achievers (GA), N = 11 couples; gifted underachievers (GU), N = 18 couples; average achievers (AA), N = 8 couples; average underachievers (AU), N = 12.

Mean and range IQ for boys in each of these groups were as follows: GA, mean IQ = 137, range: 133-142; GU, mean IQ = 130, range: 125-141; AA, mean IQ = 104, range: 101-116; AU, mean IQ = 94, range: 84-114.

Both parents in each group completed The Family Assessment measure (FAM), a self-report questionnaire, in which each parent independently rated his/her family. As well, it included ratings by each parent of his/her own behaviour in the family, his/her role and level of functioning.

The FAM is a standardized and reliable measure which significantly differentiates between clinical and non-clinical families (Skinner, 1985).

Our clinical experience, from which arose the present hypothesis, delineated the GU families as remarkably different from families of nongifted and families of gifted children who do not demonstrate underachievement. Namely, in the families of gifted underachievers,

we expected that fathers would report more problems in their families than mothers. Moreover, we described these fathers as some kind of underachievers in their families and expected that they would rate themselves as having more severe problems than the mothers, with respect to these families, and would also report their families to be more problematic than all other families in our sample. The findings that fathers in the GU group consistently scored higher (p ▶.001) than mothers on both the FAM and the Self-Rating scales provided new and striking experimental validations to these clinical observations and corroborated previous similar claims in the literature (Dell, Dahlstrom & Winter, 1984; Gelcer & Dick, 1986; Groth, 1971; Jordan, 1976).

Of these observations, none has so directly examined the gifted boy-father relationship nor have these observations ever been subjected to experimental validation until the present study. This point was especially strengthened when we noted that the only two scales on which the mothers in the GU group scored higher than fathers were Social Desirability (SD) and Defensiveness (D), the tests of validity on the FAM! On these two subscales, designed specifically to measure the response style of subjects, GU mothers scored significantly higher than GU fathers. These scores may provide direct indications that these mothers have either artificially depressed their profile, or the results may be interpreted as showing distractions in more than one direction (Skinner et al, 1984).

This finding is especially striking in view of the following two additional observations: a) mothers in the AU group scored nearly the same as fathers on these two subscales and b), whereas in the gifted groups, mothers generally scored higher than fathers, within the two average groups it was fathers who scored higher than mothers. The latter observation, then, might bring into question the FAM profiles of fathers in the Average groups. However, in reviewing the Achievement factor alone, it is interesting to note that the two groups of Achievers' fathers indeed showed a trend to score higher than the Underachievers' on SD and D, an observation which was also noted by Skinner et al (1984). They stated that "non-problem families have a tendency to be somewhat higher in Social Desirability and Denial" (Skinner et all 1984, p.98).

Given the specific location of the GA and AA groups' scores, relative to the rest of their profiles, one could probably be justified in assuming that these elevations may be suggestive of only minor dis-

tractions, if any. These findings also support our extensive clinical observations of mothers in the GU group as being more supportive of their families' problems than fathers and more skillful in smoothing-out problems or in placating.

Specifically, differences between parental styles of reporting showed significant variations in at least two areas of family functioning, namely, Affective Expression and Values and Norms. Significant differences between the scores of spouses on these two subscales furnished evidence for marital disharmony in these realms of family life. Moreover, issues which brought conflict to a head between these parents were directly related to the gifted child. With regard to Affective Expression, for example, our clinical observations were consistent with these findings. Namely, both parents focus exclusively on their son's intellectual powers as a unique attribute. However, whereas fathers simply cannot fathom their gifted child, mothers push and pull them in different directions (Albert, 1978; Fine, 1977; Gelcer & Dick, 1986).

Fathers are usually rational, emotionally distant or overly-critical in demanding that their sons either accomplish more than they, themselves, had in the past or do not struggle as much, because "it is not important to be smart, as long as you have friends—". Mothers, on the other hand, appear to relate to these boys either through infantilization or adultomorphization; either they literally protect and "baby" these children, feeling sorry and sad for them or they relate to them as substitute spouses, "pals" or co—parents (Newman, 1978; Thiel & Thiel, 1977; Cornell, 1983). In either case, there are clear problems in the appropriateness of affect expressed both on the mothers' as well as the fathers' part.

Significant findings reported on Values & Norms portray feelings of bitterness and friction in relation to authority figures. Parents arguing about value-laden issues ranging from: to which church to belong and what family surname should the child have (mother's or father's), to whether the educational system is adequate or not. Moreover, as we have noted in the past (Gelcer & Dick, 1986), spouses do not only disagree with each other about these issues, but each of these parents may also disagree, in his/her own way, with the cultural norms outside. These conflicts remain unresolved, taxing much of the crative talent with which these individuals are endowed.

In the absence of resolution, however, the gifted son continues to underachieve, or simply to express feelings of isolation and boredom.

Whether he models on his father, or gets his cues from his mother, his options for achievement and success, in this context are limited. He enjoys little affect nurturance and is frequently confused about what is important and what is not.

There is a remarkable contrast we have observed, in parents of gifted achievers' group. These seem to be clear about their goals — individual and shared. They cooperate with each other and strive for greater affective expression. Most remarkable, however, is that the atmosphere in these families is definitely of industriousness and problem solving. Hardly is any time wasted and individuals are both accounted for and accountable (Gelcer and Dick, 1986). Achieving gifted boys fit into this familial context as any other piece of puzzle would.

Thus we could summarize the present findings as shedding new light on the lives of families of gifted underachievers. Their fathers lack a sense of accomplishment in their families, while their mothers feel either overly enmeshed in, or too detached from family issues. In addition, marital disharmony focuses on socio-cultural issues, as well as on the means by which each spouse indicates their his/her caring for a variety of family members. These two issues are interrelated: in the absence of expressing one's feelings directly, these parents may pick an argument or a fight about some normative or ethical issue, or another, as their means of showing how much they are in tune with the world around them, indirectly saying "we care".

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Comparison of Life Stress of the Students in Gifted Special Classes, Gifted Resource Classes, and Honor Classes

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The purpose of this study was to compare the differences in life stress between students in Gifted Special Classes, Gifted Resource Rooms, and Honor Classes. A sample of 546 students was selected from nine junior high schools in Taipei. The Student's Life Experience Scale was administered to the subjects. The data collected were examined by one-way ANOVA and multiple comparison procedure. The results are summarized as follows: Students in the Honor Classes experienced a higher degree of stress, as compared to those in the Gifted Resource Rooms. However, there was no significant difference between the two gifted groups. Students in the Honor Classes also felt more schoolwork stress, with more physical stress and psychological stress as well as more anxiety over their future prospects, than the other groups.

Introduction

Gifted students in special classes generally entertain a stronger sense of belonging because their parents and teachers are mutually cooperative. Moreover, due to the fact that it is relatively easier to ar-

range their curricula, special classes attain more administrative support. But under the pressure to squeeze into a top senior high school, the content and methods of teaching in special classes often deviate from their usual course. Furthermore, keen competition among students often leads to tensions in both teacher-student relations and peer relations.

Resource rooms, on the other hand, cater to individual needs. Cramming is also rare. But, as it is a difficult task to design their curricula, resource rooms receive less administrative support. Moreover, some parents become uncooperative because they think it is the sole purpose of school education to have their children enter a top senior high school. Thus, gifted students in resource rooms are taxed with a dual burden: they cannot neglect preparation for the examinations of regular class; at the same time, they have to live up to the requirements demanded of gifted students.

In the case of honor classes or high achievement regular classes, many teachers overtax their students with assignments and quizzes. Because of mounting much pressures, some honor students display maladjustment such as anxiety, withdrawal, fear, insomnia, poor appetite or even truancy.

Most studies shared the findings that gifted students were mentally better developed, relationally more popular, and showed greater adaptability and emotional stability than average students (Gallagher, et al., 1960; Grace & Booth, 1958; Kerstetter, 1958; Lessinger & Martinson, 1961; Terman & Orden, 1947; Huang, 1972). However, some Chinese investigators (Huang, 1983; Kuo, 1979; Lu, 1982) indicated that gifted students in special classes showed lower self-concept than high achievement students in regular classes, and gifted children in special classes were relatively more passive, diffident, and more pessimistic toward their future prospects than high achievement children in regular classes.

Method

The subjects consisted of 546 students selected from 9 junior high schools in Taipei. Among these, 80 subjects were enrolled in the Gifted Special Classes, 184 subjects attended the Gifted Resource Rooms, and 282 subjects attended the Honor Classes. They were administered to the *S*tudent's *L*ife *E*xperience *S*cale (SLES). The SLES consists of the following subscales: Physical Perceptions, Psycholog-

ical Perceptions, Teacher-student Relations, Parents-Son/Daughter Relations, Peer Relations, Schoolwork Problems, and Future Prospects. Each subscale contains 9 items. The full scale sums up to 63 items. Each item was constructed in 4 point-scale format.

Results and Discussion

The results showed that the total mean score of the SLES of the Honor Classes is higher than the mean score of the Gifted Resource Rooms. Students in Honor Classes felt more stress than those in Gifted Resource Rooms in the following areas: Physical Perceptions; Psychological Perceptions; and, Future Prospects. They also showed higher Schoolwork Problems than two gifted groups. No significant difference was discerned between the two gifted groups in the total mean score of the SLES.

However, the sources of stress among the three groups were not necessarily the same. The greatest stress for students in Gifted Special Classes came from Peer Relations (M = 20.70). This may be attributed to the fact that part of the courses required them to leave regular classes for resource rooms. In their responses to stress concerning Peer Relations, the following statements ranked highest on this subscale: "I hope to win the love of my classmates;" "I do not like to be treated as special;" and, "I care about my peers' criticism about me."

The greatest stress for students in Gifted Resource Rooms came from Teacher-Student Relations (M = 20.78). This may be related to the fact that their teachers placed high expectations upon them. Tops of their responses on this subscale were: "I long for the praise of my teachers;" "I do not like a certain teacher;" and "I expect my teachers to show more concern about me."

The greatest stress for students in Honor Classes came from Schoolwork Problems (M = 21.62). Highest on this subscale were: "I am afraid I cannot get admitted to an ideal school;" "I fear that my records fall short of the standards set by my teachers;" "I cannot concentrate on studying;" and, "I am afraid of poor examination performance resulting in the loss of interest in classes."

With all subjects under examination taken into account, the greatest source of stress came from Peer Relations (M = 20.46), followed by Schoolwork Problems (M = 19.92), Teacher-Student Relations (M = 19.47), Future Prospects (M = 18.72), Psychological

Perceptions (M = 17.69), Parent-Son/Daughter Relations (M = 15.38), and Physical Perceptions (M = 15.18).

Highest on the list of 63 items concerning student stress was "I hope to win the love of my classmates" (M = 3.25). This showed that students thought much of personal relations, which was an important factor directly affecting one's learning attitude and emotional stability. Second highest on the SLES was "I do not like to be treated as special" (M = 3.20). This indicated that though gifted students and students in Honor Classes were the outstanding few among their peers, they did not like their teachers and parents to place high expectations upon them, nor did they like their classmates to look upon them as special, i.e., they want to be treated as equals. this statement showed that they craved to be well-accepted by their peers. Third highest on the SLES was "I am afraid I cannot get admitted to an ideal school" (M = 3.13). This question implied that the high expectations from parents and teachers hovered over the student's mind throughout his/her school life.

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Mentoring Gifted Children & Prodigies: Personological Concerns

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Abstract

Mentoring has begun to be seen as most viable option for the growth of gifted, talented children.

This paper addresses personality issues and personological variables salient to the process of mentoring gifted children.

Prodigies

The process of mentoring, that of pairing up a wiser, older mentor, with a younger, ambitious protege has been with us in business, the arts, and in education for many years. Recently, many books, articles, and indeed, international conferences have focused on the process of mentoring. Collins (1983) has explored the realm of women and their mentors. Levinson (1978) has examined the role of the mentor and "special women" in the life span of the male. Paul Torrance (1984) has written about how mentor relationships aid creative achievement, endure, change and die. Shaughnessy (1986) has written on mentoring the creative child, adult and prodigy and Shaughnessy and Neely (1987) have investigated the role of the men-

tor with gifted freshman college students. The "parent as mentor" issue has been examined by Shaughnessy, Neely, and Azubike (1986) and Shaughnessy and Neely (1987) and the importance of the mentor in the realm of research has been explored by Shaughnessy (1984).

The present paper addresses two issues regarding mentoring. First, what personality traits, factors and variables are salient in the mentoring relationship? What specific personality aspects are critical for a good mentor-protege relationship? Second, what are the personological traits of the gifted individual which are critical to understanding and facilitating the mentoring process?

The paper will lastly address needed research in this area.

"Pretuned and preorganized" is how Feldman (1987) describes prodigies. They tend to be "fine tuned to their area of interest, explore it in depth, devour it with passion, and then often turn on their mentors as would a rabid dog, after they have devoured everything their mentor has had to offer."

Often a mentor's teaching style may not be compatible with a protege's learning style. A disciplined, organized, systematic approach may conflict with an earlier mentor's folksy, slow, historical methods of pedagogy.

The mentor must also be able to "let go", to recognize their limitations and to allow the protege to move on to another teacher. Relinquishing one's domain over a student whom you have nourished, nurtured, and assisted may be quite difficult for some. The mentor must be mature enough, objective enough, and responsible enough to allow the student to "leave the nest."

Admitting one's inadequacies is not easy for many. Yet in order for the prodigy or gifted child to grow, one must acknowledge that they are not "top-flight" teachers, but merely, middle level experts. A mentor must also be ready to terminate his/her supervision prematurely and understand that parental involvement and boredom on the part of the student may be the causative factors, rather than incompetence on the part of the student.

Parents may be concerned about procuring a mentor for their gifted son/daughter. Zey (1984) emphasizes the following factors in selecting a mentor (p. 167):

1. Is the mentor good at what he/she does?
2. Is the mentor getting support?
3. How does the organization judge the mentor?
4. Is the mentor a good teacher?

5. Is the mentor a good motivator?
6. What are the protege's needs and goals?
7. What are the needs and goals of the prospective mentor?
8. How powerful is the mentor?
9. Is the mentor secure in his/her own position?

Erkut and Mokros (1984) have written on the "professor as model and mentor" for college students. They note that men tend to avoid female models. A further concern is "that women do not receive as much mentoring as do men" (p. 400). This is regrettable as much potential is wasted. Male students look for models/mentors with power and status who could conceivably assist them with their education and future career. The female students look for a female model who has integrated both family and career.

E. Paul Torrance has suggested the following seven suggestions for mentors to help creatively gifted youth:

Help them to:

1. Be unafraid of "falling in love with something" and pursue it with intensity and in depth. A person is motivated most to do the things they love and can do best.

2. Know, understand, take pride in, practice, use, exploit and enjoy their greatest strengths.

3. Learn to free themselves from the expectations of others and to walk away from the games that others try to impose upon them.

4. Free themselves to play their own game in such a way as to make the best use of their strengths and follow their dreams.

5. Find some great teachers and attach themselves to these teachers.

6. Avoid wasting a lot of expensive, unproductive energy in trying to be well rounded.

7. Learn the skills or interdependence and give freely of the infinity of their greatest strengths (pp. 56-57).

In terms of personality traits and variables which are operative in terms or counseling the gifted child or prodigy, many have been noted. These aspects and a description of each from Sternberg (1985) follow. These are personality characteristics which often hinder or prevent very bright children from learning, and succeeding.

1. Lack of motivation.
2. Lack of Impulse Control.
3. Lack of persistence/preservation or perservance.
4. Capitalizing on the wrong abilities.

    5. Inability (or difficulty) in translating thought into action.
    6. Lack of product orientation.
    7. Task completion problems and lack of follow through.
    8. Failure to initiate.
    9. Fear of failure.
    10. Procrastination.
    11. Misattribution of blame.
    12. Excessive self pity—Feeling sorry for oneself.
    13. Excessive dependency or over-reliance on others.
    14. Wallowing in personal difficulties.
    15. Distractibility and lack of attention.
    16. Spreading oneself too thick or too thin.
    17. Inability to delay gratification.
    18. Inability or unwillingness to see the forest from the trees.
    19. Lack of balance between critical analytic thinking and crea-
tive synthetic thinking.
    20. Too little or too much self-confidence.

Matching Temperament and Intellectual Style

    Much has been written recently regarding "learning styles" and
"cognitive styles". Processing differences such as the simultaneous
vs. sequential posture of Kaufman and Kaufman is a position which
is linked to an actual test. Gregoric and others, Dunn and Dunn
(1978, 1979) and Dunn and Bruno (1985) have focused on the idea of
learning styles. A recent review, however by Wiley, Baker and
Shaughnessy (1987) find this posture lacking in both validity and reli-
ability.

    However, some mention must be made of instructor and protege
temperament and teaching/learning style. With some gifted students
a gentle, encouraging prodding style appears necessary. Other men-
tors hold ambitious, prejudicial, highly idiosyncratic views as to the
teaching process.
    The relationship between teacher/mentor and protege/student is
seen as a most delicate balance. The teacher/mentor must be secure
and confident in his/her own skills and abilities. Feldman (1987) says
the "teacher should be kind, enthusiastic, encouraging, positive and
patient" (p. 145).

Future Needed Research

The gifted child and his/her relationship to their mentor must be investigated, if possible. So many people have described the mentor/student relationship as so tenuous, so brittle, so fragile, that there has almost been fear and apprehension regarding empirical investigation.

In effect, the "life span" of the mentor/student relationship must be investigated. All too often, a student chooses a master teacher/mentor, then must later change to another, more sophisticated mentor. When the protege realizes he/she has reached a point of diminishing returns with that mentor, the relationship must end or it will stagnate. This is not to say that the relationship ends, but the tutorial stage/state ends.

We still know relatively little about the process of enhancing human development. Does a Mr. Rogers approach work better than the tough coach tactics of Bobby Knight? How does one go about choosing the best approach?

Further, are "experts" the most caring, creative, innovative or best instructors? What of the separation between adolescent and the child's first mentor—the parent?

Finally, what form should said research take? Case studies, observational methodologies and experimental approaches may or may not be appropriate in all cases.

The role of the mentor is quite varied. Daloz (1986) views the mentor as a guide whose major task "is to challenge students to challenge themselves." (p.229) Daloz presents five such methods.

1. Modeling.
2. Keeping tradition.
3. Offering a Map.
4. Suggesting New Language.
5. Providing a mirror.

Daloz (1986, pp. 239-243) offers five suggestions for improving the quality of the mentoring relationships we provide.

1. We can begin listening to our students' stories.
2. We can view ourselves as guides.
3. We can plan our meetings and classes to promote development.
4. We can turn to and bring together others who share our concerns.

5. We can recognize that in part our own growth depends on our students.

Younger women also find it difficult to have an older man as a mentor (Odiorne, 1985). Social pressures and concern about appearances to others may make some men reluctant to mentor a younger woman. These problems may restrict the number of mentors available for younger women.

This paper has endeavored to cursorily examine a number of different issues in mentoring gifted / creative children. Further research, writing, and theorizing is, of course, imperative.

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What's Going on in Gifted Class? Student Perceptions of Classroom Activities in a Special Mathematics Program

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Proponents of special educational programming for gifted and creative children generally consider differential instruction a must for able learners. Generally, divergent thinking and problem solving tasks are most frequently discussed in the context of general enrichment; however, differentiated instruction is also recommended for academic core disciplines like mathematics as well (Hersberger & Wheatley, 1980).

How students spend their time in the classroom affects what they learn and what attitudes they develop toward learning. If creative, bright students cconstantly drill math facts or are assigned only repetitious, algorithmic problems, their enthusiasm for studying mathematics is at risk. In fact, ambivalence or dislike for mathematics has been reported by several large scale studies (McKnight et al., 1987; National Assessment of Educational Progress, 1983; National Science Foundation, 1982). Particularly distressing to educators of the gifted is the finding that modest interest and mediocre performance are characteristic of our most talented mathematics students as well as the general cohort.

To address these issues, in 1984 the Winthrop Rockefeller Foundation awarded a grant to the University of Arkansas at Little Rock

to develop a program for mathematically talented students in grades two through twelve. The program combined elements of enrichment, problem solving, and acceleration with extensive computer use, particularly in the elementary grades. This study is part of the large scale evaluation of the project carried out in 1986-87 and focuses on the question of students perceptions of classroom activities in mathematics. Specifically, are there differences in able students' perceptions of instruction in "gifted" versus regular math classes? Do students served by a specially designed mathematics curriculum and students served by the regular curriculum differ in the perceptions of mathematics opportunities they have? Do they differ in their preferences for those mathematics activities? And finally, do differences exist in the magnitude of the "gap" between what math activities students prefer and what opportunities they have to engage in them?

Methods

Subjects. 206 subjects enrolled in grades two through six participated in the survey portion of the study. 56 experimental subjects received their mathematics instruction in the Gifted Math Program, which provided approximately four hours of instruction per week with voluntary access to a computer lab on Sunday afternoons. 150 control subjects received their math instruction from their "regular" mathematics teacher. Most controls were attending achievement grouped classrooms and were, therefore, placed in mathematics classess for high ability students. Some controls were grouped by ability within classrooms. A few controls received their mathematics instruction in a heterogeneously grouped setting.

Identification procedures for program participants included out-of-level mathematics achievement testing with the Sequential Tests of Educational Progress (STEP), an ability measure (Raven's Matrices), and teacher and parent checklists which included items on math interest and achievement and general characteristics of creative and gifted children. The experimentals for the study were students selected by the identification procedure. The controls were students who applied to participate in the Gifted Math Program and fell into one of two groups: 1) students who were selected but elected not to attend 2) students who were designated as alternates. The achievement and ability test scores used in the identification process revealed few differences between experimentals and controls. In the analyses

of achievement outcome data in computation, concepts, and problem solving, the two groups were statistically equated. These data are reported elsewhere (Robinson, 1987). The two groups were not statistically equated for analyses of the attitudinal measures.

Measures. Student perceptions of mathematics classroom instruction were assessed by a survey instrument developed for the study. The *Mathematics Survey* included two sections of Likert scales. The first of these sections asked students to rate on a five point scale how *often* they had certain opportunities in their mathematics class. The second of these sections asked students to rate on a five point scale what they *liked* about math class. The items in the two sections were parallel. Thus, the analyses permitted conclusions to be drawn about the discrepancies between what opportunities gifted students *have* and what they *want* in mathematics class. The Likert items were based on opportunities often recommended for able mathematics students by the experts (Wavrik, 1980; Wheatley, 1985).

Procedures. Surveys were distributed to all elementary participants and controls with a return envelope included to encourage response. Approximately 280 surveys were sent. Two weeks later, a follow-up letter and duplicate survey were sent to those who had not yet responded. A total of 206 elementary students responded to the survey. The rate of return was 74% which is considered adequate for a survey of this type.

Results and Discussion

The results are reported as they relate to the three questions posed in the study.

First, are there differences in opportunities for talented students in a special mathematics curriculum as compared to talented students receiving instruction in homogeneously or heterogeneously grouped classrooms? The analyses indicated that overall, students do perceive differences in opportunities. On all seven dimensions which compared the perceptions of experimentals and controls, statistically significant differences were obtained. Students served by the Gifted Math Program were more likely than the controls to report that they had opportunities to (Chi Square and probability values are listed in parentheses):

work on interesting problems (33.94, .01)
work with friends to solve a problem (34.52, .01)
work on the computer (112.64, 01)

participate in math competitions (17.47, 01)

work on your own math project (21.81, 01)

learn about math ideas not in the textbook (34.20, 01).

The second research question investigated differences in what able math students like about mathematics instruction. The analysis indicates that, overall, there are no statistically significant differences between the expressed preferences of experimental and control students. In other words, these two groups of students are very similiar in their attitude toward activities in the mathematics classroom. For example, 78.5% of the subjects (both experimental and control) report they like working on interesting problems. 62.8% like working with friends to solve a problem. 93.3% like working on a computer. 67.6% like to participate in math competitions. 55.8% like working on their own math project. 76.2% like lerning about math ideas not in the textbook. However, only 38.7% of the survey students like the math textbook.

The final research question was conceptualized as an investigation of the differences in the *magnitude* of the gap between student preferences and opportunities for mathematics classroom activities. Overall, the data indicate that students who received their instruction through the Gifted Math Program report a significantly smaller discrepancy between what they *want* and what opportunities they *have* than students served through the regular mathematics curriculum. Specifically, experimentals report a smaller gap between preference and opportunity on the following dimensions (t values and probability values are listed in parentheses):

working on interesting problems (5.12, 01)

working with friends to solve a problem (5.08, 01)

the textbook (3.53, 01)

working on the computer (13.41, 01)

participating in math competitions (3.68, 01)

working on your own math project (3.65, 01)

learning about math ideas not in the textbook (3.94, 01)

On all dimensions but one, experimentals expressed a positive attitude toward the activity and reported a significantly smaller gap between the opportunities they had to engage in those activities and their preferences for doing so than did control students. The dimension which displayed a slightly different pattern was the item concerning the textbook. Both experimentals and controls reported they had more opportunities to work in the textbook than they wanted. However, the experimentals continued to report a smaller gap be-

tween preference and opportunity, i.e., experimentals perceived they were working less in the textbook and they liked it that way. Thus, overall, the students in the Gifted Math Program are more likely to perceive their needs being met than gifted students served in the regular mathematics classroom. Perhaps these "met preferences" will result in generally more positive attitudes toward math and a continuing motivation to take mathematics courses by our talented math students.

These same mathematically talented students also outperformed their control counterparts on traditional math achievement and standardized math problem solving measures (Robinson, 1987). At present, it is not possible to isolate the direction of causality in terms of mathematics preferences and achievement. The special mathematics curiculum did result in students' reporting a smaller discrepancy between *want* and *opportunity*. The special mathematics curriculum also resulted in significantly higher achievement. What cannot be said is that "met preferences" caused the higher achievement. What can be said is that "met preferences" and higher mathematics achievement appear together and as a result of a special mathematics curriculum differentiated for the able mathematics student.

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Moral Judgment and Depression in Gifted Adolescents

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Moral judgment, an aspect of the psychology of morality, is concerned with how a person judges which course of action in a social situation is morally right or defensible (Rest, 1986a). Most studies of moral judgment have used Rest's (1979) Defining Issues Test (DIT), which is based on Kohlberg's theoretical formulations. Moral reasoning in the gifted, however, has received scant attention. Tan-Willman and Gutteridge (1981) and Rest (1986a) suggest greater principled reasoning for small samples of gifted high school students compared to their peers. However, Henderson, Gold and Clarke's (1984) gifted subjects had DIT scores that resembled those of average high school students. The current study, with a large sample of clearly gifted Southern adolescents, would permit clarification of the relationship of giftedness to moral judgment.

A second thrust of the current study was to investigate the possible existence of a relationship between depressive symptomatology and moral judgment. Rest's (1986a) Four-Component Model posits an interrelationship between cognition, affect, and behavior. Psychoanalytic concepts of a punitive superego and unrealistic ego ideal could, in part, lead to adolescent depression, including success depression. Furthermore, in an unpublished ten-year longitudinal study by Deemer (cited in Rest, 1986a), those high school students

who followed a path leading to high as opposed to low moral judg-
ment were characterized as more energetic, more active in goal striv-
ing, more responsible for outcomes, and less devastated by disap-
pointments and failures. The inference might be drawn from this
research that Deemer's "high group" was not depressed, or certainly
less depressed than the "low group". Finally, in our own research
(Berndt, Kaiser, and van Aalst, 1982), we have noted that a subset of
gifted students may indeed experience at least a mild version of suc-
cess depression.

METHOD

Participants

Participants were 248 junior and senior high school students (124
males and 124 females ranging in age from 14-17 years) who attended
the Governor's School of South Carolina, a select summer program
held at the College of Charleston. The students, chosen in proportion
to enrollment from public and private schools statewide, ranked at or
above the top 5% of their class, or scored equivalently on standard-
ized ability or achievement tests. They were identified by their
schools as the most intellectually and creatively gifted.

Instruments

Participants were administered two self-report instruments on the
first day of the formal program; the Rest (1986b) Defining Issues
Test (DIT) and the Berndt (1986) Multiscore Depression Inventory
(MDI).

The DIT is an objectively scored, reliable, and valid device for de-
termining a person's level of moral judgement. After reading each of
six moral dilemmas the subject is asked to respond to 12 issue state-
ments by indicating on a Likert scale the importance of each issue in
resolving the dilemma. These issues are prototypic statements of the
various stages of moral reasoning. The P index (sum of weighted
ranks given to Stage 5 and 6 items) is interpreted as the relative im-
portance a subject gives to principled reasoning across the dilemmas,
and is usually expressed as a percent. The D index uses information
from all stages to generate a composite score. Checks on reliability

and consistency resulted in elimination of 35 cases from the analyses. All scoring employed Fortran programs outlined in the DIT manual (1975, 1986b).

Berndt's Multiscore Depression Inventory is a reliable and valid 118-item self-report questionnaire designed to be useful for studying severity of depressive symptoms with subclinical and normal populations. Respondents read statements that describe how some people generally feel and are asked to indicate whether each statement applies to them using dichotomous true or false responses. The DMI's subscales independently measure 10 important features of depression: sad mood, guilt, learned helplessness, instrumental helplessness, low energy level, social introversion, irritability, pessimism, cognitive difficulty, and low self-esteem.

RESULTS

Subjects were divided into three groups both by the P% and D scores, according to the cutting points recommended by Rest in the DIT manual. These three groups corresponded to high, medium, and low levels of moral judgment development. The first analysis was a

TABLE 1

Obtained and Expected Percentages of Subjects at Three Levels of Moral Development as Measured by Rest's Two Statistics

	P%*		D•	
Level	**Obtained**	**Expected**	**Obtained**	**Expected**
Low	20.0	(1/3)	12.7	(1/3)
Middle	39.9	(1/3)	62.7	(1/3)
High	39.9	(1/3)	24.6	(1/3)

*Chi-square (2) = 7.76, p ◄ .05.

•Chi-square (2) = 55.07, p ◄ .01.

Chi-square analysis to determine if the scores were distributed in the expected proportions of one-third in each group.

As Table 1 indicates, subjects were more frequent than expected in the high and medium P% groups, while the D distribution contained greater than expected numbers in the medium group. The P% and D means were 37.8 and 21.9, respectively.

To determine the best linear combination of depression subscales that might maximally discriminate gifted individuals across levels of moral judgment, a discriminant analysis was performed using Rao's V as the criterion and identifying groups once again with the recommended cutting scores for both P% and D. With the D statistic, no significant function could be identified. With the P% statistic, a trend towards significance was identified (p ◄ .06). Three variables, according to the trend, separated the highest two levels of moral reasoning from the lowest third. Cognitive difficulty had a high positive coefficient, with irritability and instrumental helplessness contributing negative coefficients greater than .40.

DISCUSSION

These data demonstrate that gifted adolescents resembled college students in moral reasoning more closely than their peers, although we cannot conclude that their judgment was fundamentally at the principled level. In one sense, this finding is not surprising. IQ, aptitude, and standard achievement tests, which assess abstract reasoning, problem solving and general knowledge have significant positive correlations with cognitive developmental measures (Rest, 1986). Piaget (1973) claimed that gifted children are capable of thinking on the level of formal operations at an earlier age than their peers.

There was no significant relationship between level of moral judgment and self-reported depressive symptoms in this select sample. We must caution the reader, however, that it would be unwarranted to assume that the results generalize to all adolescents or to adults. Most of the subjects were not depressed, and in those 14% who reported moderate depression (MDI Full Scale *48 or T-score* 61; Berndt, 1986) existence of clinical depression was not assessed. Clearly, additional research is required before a definitive conclusion is reached concerning the relationship between depressive features and moral reasoning.

At least some gifted adolescents experience what appears to be success depression (Berndt, Kaiser, and van Aalst, 1982; Kaiser and

Berndt, 1985). Seligman (1975) focused on reduced contingency between one's actions and good or bad outcomes. Perhaps for some gifted individuals rewards come too easily, or for reasons unrelated to perceived initiative or competence. Seligman observed that depressed successful people may say that they are rewarded for *who* they are or what they have *done* in the past. Encouraged to be perfectionistic and self-critical, it is likely that some gifted adolescents who become depressed perceive themselves as lacking self-efficacy, i.e., not doing or accomplishing what they believe they could. They may harbor negative future self-efficacy expectations, often in spite of what others believe, without appropriate consideration of what is realistically possible. Consequences include devaluation of one's activities, the rewards attendant to the activities, and depressive symptoms. In the current study, however, the large sample size may have eclipsed any effect on a small subset of gifted students.

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Follow-Up Study of Gifted Students in a University Based Program

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In 1981/2 the Ministry of Education and Culture in conjunction with the Ben-Gurion University in Beer-Sheba conducted a follow-up study of the cognitive and affective development of gifted students from culturally different backgrounds in a university based program. The results were presented at the Fifth World conference of Gifted and Talented Children (Burg, 1983) in Manila in 1983.

The main purpose of the program was to introduce the students to a wide variety of subjects designed to broaden their general knowledge and understanding rather than provide a hierarchically structured curriculum in one of the subjects.

Each student was enrolled in two courses of his own choice, one in the sciences or mathematics and the other in the humanities or social sciences, in order to balance these two domains. The courses were given in the afternoon once a week during a two-hour session within the framework of 20-23 meetings, throughout the year.

The majority of the students (82%) expressed a marked preference for sciences, mathematics and biology, while the humanities and social sciences attracted only 9% (other replies 9%). This preference

was characteristic not only of the boys but also of the girls who con-
stituted about one-third of the 1981 / 82 program.

At the beginning of the school year 1986/7, a follow-up study
was designed. Its main purpose was to find out what happened to the
141 students who had participated in the programs for the gifted at
the Ben-Gurion University in the school year 1981 / 2.

We knew that some of them were still in high-school, others
already in the army or enrolled as regular students in the different
university departments. We were curious to learn whether a change
had occurred in the students' interest, or if they still preferred the sci-
ences, mathematics and biology.

We hoped that the exposure to a balanced program at the Ben-
Gurion University might have changed the students' attitudes
towards the humanistic and social science subjects.

Of the 141 questionnaires which were sent to the students who
participated in the 1981 / 2 study, 95 questionnaires (67.4%), were
returned to us — by 61 boys and by 34 girls. Of the 46 students who
did not reply, 12 could not be located since they had moved to other
cities and 34 preferred to ignore the questionnaire.

We concluded that all the girls and 60% of the boys from lower
socio-economic strata (SES) replied to the questionnaire, and about
60% of the girls and 70% of the boys from middle class backgrounds
returned the questionnaire.

Sixty-five students reported now, that in retrospect, their favored
subjects were the sciences which included mathematics, physics,
chemistry, biology, zoology, or medicine. Fifteen students remarked
that their choice was a combination of science with some humanistic
subjects; twelve combined sciences with social sciences; and only
three students out of 95 stated their preference for the humanistic
and social science subjects.

We were interested in finding out what motivated the students to
participate in the courses at the university-based program, especially
those who had been in the program for longer than two years. We
thought that besides the subject matter, the personality and ability of
the teacher or the differences in the teaching styles (individual or
group work), the students might have been motivated to attend the
courses because of social ties developed throughout the years.

The students were asked to state their replies in order of prefer-
ence. From their replies we were able to form three main categories:

a) the subject matter, b) the instructor and c) the different teaching styles which were used by the university instructors. Social ties were not mentioned by the students.

The results showed that the *subject matter* was ranked by the largest number of students (91) as the main reason for attending the program. They enjoyed the science courses of which the topics were different from the ones taught at school. The courses provided a new insight into the science programs and enabled them to explore new topics. They arose their curiosity, directed the students towards reading books, booklets, or monthly magazines for youngsters interested in science. Even though some preparation and assignments were given (which were by no means easy) the students remembered them as an intellectual stimulus and stressed their enjoyment which also found its expression in the choice of additional science courses.

Eighty-one students listed the *instructors* as being the second most important factor in motivating their attendance. At the beginning of each school year students met with the different instructors who presented their subject matter. Each student had an opportunity to listen to the instructors, ask questions and decide whether to enlist in one of the courses.

The teachers were university graduates, doctoral students or lecturers who were interested in teaching the gifted. It was important to find dedicated people who not only excelled in their field of knowledge, but who were also able to impart it to young students and arouse their interest. These instructors served as a role model with whom the students could identify.

Third in importance, 79 students mentioned the *teaching style* as a reason for attending the courses. Frontal lectures were a necessary part of the program but most of the work in the sciences was either in the laboratories or computer rooms where each of the students could study individually or in small groups. In the laboratory, the students were taught how to perform experiments in systematic way, as well as learning rules, skills and techniques for using the equipment. In addition, part of the experiments were conducted outside the laboratory. Many students mentioned that these courses provided them with tools for defining problems and conducting organized research. This process contributed to the development of their critical thinking.

In our follow-up study, questions were related to the contribution of the program to the students' choice of their present studies.

The 95 students gave 123 answers indicating that some of them had given more than one reply although they were asked to mark only the most pertinent one.

The results were as follows:

8 — thought that the program had not contributed to the choice of their present interests.

38 — stated that the causes had directed them towards their choice of future studies.

25 — said that the courses had an impact upon their approach to their compulsory curriculum at school.

23 — felt that the program had broadened their horizons.

22 — found that the courses had increased their interest in fields they had not yet encountered.

4 — mentioned that the program helped and contributed without giving further specification.

3 — said that the courses had been pleasant and enjoyable.

Another question which interested us related to the present status of these adolescents.

The majority of the students, 59 out of 95 are in the 11th or 12th grade of their high school education. Of these students, only 15 are in the humanistic stream while 44 have chosen mathematics and sciences.

Twenty-three are now serving in the army, of which 18 are involved either in tasks requiring mathematics, science and computer backgrounds or have an opportunity to study these subjects during their regular army service. The additional 5 students perform tasks unrelated to their studies.

Finally, 13 students have already enrolled in the different mathematics and science departments of the university. None of them study subjects in the humanities or social sciences.

We are encouraged by the fact that about 15 out of the 59 students (or 25%) still in high school have chosen the humanistic stream, but rather disappointed that at the university level, not even one of the 13 students have done so.

In our analysis of the gifted students' choice or direction one cannot disregard the environmental influences such as home-background and parents who serve not only as models or supportive agents but undoubtedly have an impact upon their children's future choice.

We regard the humanities as an important factor in educating a person not only as an individual but also as a member of a community where responsibilities are shared.

During the last 3 or 4 decades attention has been focused mainly on sciences, while the growing tendency is to regard humanities as less essential. We believe in a balanced education of sciences and humanities.

In the Report of the Harvard Committee (1955) "General Education In a Free Society," humanities are of central importance. The term general education in the report "is used to indicate that part of a student's whole education which looks first of all to his life as a responsible human being and citizen, while the term special education indicates that part which looks to the student's competence in some occupation" (p. 51). Science and humanities are not entirely separable. Science is viewed as "a distinct type of intellectual enterprise, involving highly restricted aspects of reality and prepared as such to make particular types of contribution to general education" (p. 150).

We think that general education combines the fixity of aim with the diversity of application. It takes on many different forms. Yet in all its forms common knowledge and common values on which a free society depends, are represented. These values as reflected in the humanities should become an integral part of one's "becoming" towards his struggle for "being."

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Moving Toward Whole Person Development

Whole Person Development Outside of Formal Education

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Modern-day public education contains the secret to whole person development but is not even cognizant of this fact. The secret is not to be found in the traditional academic courses offered, but rather in those much maligned *"Activities* (including extra-curricular activities)." Inter-scholastic sports, music, drama, debate, etc. are *"activities"* that are not just ways to have fun or be with friends; they are valuable educational tools which enrich a person's high school experiences. Participation in these high school activities: (1) provides valuable lessons for many practical situations; (2) are not a diversion but rather an extension of a good educational program; and (3) are predictors of later success — in college, in a career and in becoming a productive, contributing member of society. Many studies have documented the link between participation in activities and higher grades and better attendance. Activities help both in students' attitudes toward self and school as well as deter drop-out rates and mitigate discipline problems.

In the real world, getting others to cooperate, leading others, coping with complex power and influence and people problems are at the heart of a meaningful life experience. There is a place where young people can learn these abilities — that place is the high school ac-

tivities program. It is a shame that the general public and the public school hierarchy have failed to realize the crucial importance of the activities curriculum in the development of the whole person. Young people should be encouraged to partake of activities in order to receive the inherent benefits.

It should be emphasized that activities are not the only things going on outside of formal education which contribute greatly to whole person development. Another interesting sub-discipline of the general area of psychology has recently gained prominence and contributes greatly to whole person development. And yes, the new field — *"Performance Psychology"* — is offered outside the normal school curriculum; but nevertheless whole person development is the principal objective of the relatively new field of "Performance Psychology." Applied performance psychology is an attempt to enhance the mental capabilities of individuals particularly when in the performance arena. This field creatively utilizes psychological theory in an effort to improve the entire person.

Our public school system, for the most part, has effectively educated the masses of our society in the so-called basic subjects — reading, writing, and arithmetic. Evidence of this success is our culture's high literacy rate. On the other hand, our education system appears to have failed miserably in other aspects of the education of our citizens. As our culture becomes more complex, shouldn't our schools teach coping mechanisms? Or is it natural that millions of individuals take valium and other drugs to mitigate the effects of stress and anxiety? Is control of the self a prerequisite to adulthood that public schools should be teaching? Or is self control the responsibility of each individual? It is obvious that the public school system can not be everything to everyone; but shouldn't this institution provide the fundamental high-level talents for a high quality of life for our society? For whatever reasons, schools have not provided the necessary skills and talents essential to the development of the whole person; so as one of the many alternatives to meet these needs the field of performance psychology has blossomed.

This field involves stretching the psychological potential of an individual in order to achieve optimal performances. Basically the field entails the teaching of three "Cardinal Skills." These skills are cognitive in nature and relatively easy to master. The three skills are: relaxation, concentration and imagery. Relaxation training can accomplish the very same results, in the control of anxiety and stress, as

drugs do. Such intervention techniques as progressive relaxation or autogenic training are extremely beneficial in teaching a person how to remain in control in pressure situations. Learning to control the situation rather than having the situation control you is the goal of this type of training. Before persons can be a master of anything, they must master themselves. Relaxation training provides an avenue of self-mastery that can be beneficial to most everyone.

The second Cardinal Skill is concentration. Almost all of us, at one time or another, have been instructed to "just concentrate." This is very sage advice; but what is meant by the term concentration and how is this skill mastered? Nowhere in the public school curriculum is concentration taught, yet everyone is expected to have this skill. Concentration is crucial in all aspects of our lives, but few of us actually master this skill. In reality, concentration is a multifaceted skill. A person must learn to broaden, narrow, focus internally, focus externally, handle many stimuli simultaneously, and transfer from one mode of concentration to another rapidly. When someone can do all of the above, then he/she has the overall skills of concentration.

The third and final Cardinal Skill is imagery. Imagery is an innate capability of the human animal that has unlimited potential. All of us image every night as we sleep—these images are called dreams. Dreaming is really nothing more than random images generated by subconscious activity. Young children are particularly adept at imagery, but seem to lose this ability at about 5-6 years of age. It really isn't a loss of the skill, just one that isn't exercised very often and thus slides into remission. Imagery is an ideal method by which to mentally rehearse various activities and situations.

These three Cardinal Skills should be learned in the order presented in this paper—relaxation, concentration, and finally imagery. An individual needs to be relaxed to concentrate, and must be in control of all aspects of concentration in order to image effectively.

The field of performance psychology is concerned not only with the three Cardinal Skills; rather its primary purpose is to develop the whole person via the expressionistic modality of performance. Topics such as motivation, aggression, psychological interventions, personality, emotional disposition, and a multitude of others occupy the interest of those involved in this discipline. Performance psychology is concerned with innovatively developing human potentials which have been forgotten or neglected. Performance isn't limited to the athletic

playing fields, rather it is something to which all of us should be cognizant. Performance psychology has something to offer to everyone and is truly a creative endeavor designed for whole person development.

In summary, this article discussed two areas that are tangentially associated with public education but are really not appreciated for their great contribution to the development of the whole person — activities and performance psychology. These two areas seem to involve the creative attributes of the participants and have lasting benefits for a higher quality of living.

A recent afterthought is that the department of one of these authors has just changed its name from Physical Education to Exercise and Sport Science. The reasons for this change are many, but one of the most important is the fact that their department is exercising and developing more than just the physical aspects of an individual. They are developing more of the mind and the body (the brain and the brawn). In other words, they are now moving more strongly toward Whole Person Development.[1]

Editorial Note: When Wilson Riles was State Superintendent of California, he was informed about the new approach of teaching to develop Multiple Brainpower Talents. He summarized his reactions by stating that what this new approach was doing was moving toward *Teaching the Whole Person*, a concept to which educators have given a lot of lip service for a long time, but have done practically nothing to put it into action.

Leisure Time Activities
of Gifted Children

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The purposes of this study were to investigate the leisure time, school curricular preferences (courses), and extra-curricular activities of groups of gifted boys and girls from seven- to fourteen-years-old who were enrolled in a private school. The results of the study are presented in Tables 1, 2, and 3.

Newspaper reading: Table 1 shows the percentage of students who reported that they read the newspaper every day, once a week, once a month, or never. As can be seen, the total percentage of students who report to reading the newspaper is higher for the upper age group, i.e., 54.4% as opposed to 28.4% for the lower level. In addition, in the younger group, more boys than girls read the newspaper every day, and this difference becomes less in the higher level.

Homework hours: Tables 1 and 2 present the data on the amount of time spent on homework assignments. Most of the younger subjects appear to spend an hour a day on homework, whereas the older students spend close to two hours on homework each day.

Time on extra-curricular activities: On an average, these gifted subjects in both age groups report to spending between two to three hours a day on extra-curricular activities.

Watching T.V. news: An analysis of this information indicates similarity in response among the two age groups. In both the age

groups, there are definite gender differences. Almost twice as many boys than girls reported watching T.V. news every day.

Home computer: Data collected show that 65.7 of the lower age group and 77.8% of the upper age group subjects have a home computer. The older group has fewer restrictions on the use of the computer. The findings show, however, that the amount of time spent on the computer is very close for both age groups, i.e., 0.7 hour for lower age group and 0.8 hour for higher age group. Also, in the upper group, the boys reported spending more time on computer than girls, 1.1 hours as opposed to 0.4 hours.

Frequency of movie going: The pattern of movie going appears to be very similar in the two age groups. The data show that about 60% of these gifted subjects do go to the movies twice a month or once a month. Some 19% of the subjects report going to the movies once a week.

Video games: 64.2% of the subjects in the lower group and 47.8% of the subjects in the upper group have a video game at home. These subjects spend about 20 to 30 per day minutes on the video game at home.

Number of books read: Table 2 presents data on the number of books read by the subjects. The younger group reads, on an average of 103 books a year, whereas the older group read 51.3 books a year. Gender differences are apparent in these data, indicating that boys are more avid readers than girls in the younger group, but the situation reversed as they get older.

Hours of T.V. watched: These gifted subjects spend 1.9 hours a day watching T.V. A high percentage, i.e., 47.8% in the lower group and 45.6% in the upper group report that they watch T.V. one hour per day.

Part of newspaper read: Table 3 presents the analysis of parts of newspaper read. The top four responses were: comics (73%), news (57%), other (42%), and sports (28%).

Favorite school subject: Table 3 presents the results collected from this item on favorite schools subjects. The top four favorite subjects were Math (28%), P.E. (21%), Art (13%), and Theatre Arts (7%).

Favorite T.V. Shows: Table 3 presents the data collected on television shows. The six most favorite shows reported by these students were: Cosby Show (58%), Family Ties (36%), Different Strokes

AGE GROUP: 7.0 to 9.11 YEARS				AGE GROUP: 10.0 TO 14.10 YEARS			
Item Description	Total %	Boys' %	Girls' %	Item Description	Total %	Boys' %	Girls' %
News Paper Reading				**News Paper Reading**			
Everyday	28.4	37.5	14.8	Everyday	54.4	58.0	50.0
Once a Week	56.7	50.0	66.7	Once a Week	33.3	28.0	40.0
Once a Month	10.4	7.5	14.8	Once a Month	10.0	12.0	7.5
Never	4.5	5.0	3.7	Never	2.2	2.0	2.5
Watching TV News				**Watching TV News**			
Everyday	34.3	42.5	22.2	Everyday	35.6	44.0	25.0
Once a Week	47.8	40.0	59.3	Once a Week	48.9	48.0	50.0
Once a Month	10.4	10.0	11.1	Once a Month	11.1	6.0	17.5
Never	7.5	7.5	7.4	Never	4.4	2.0	7.5
No. of Homework Hours				**No. of Homework Hours**			
1 Hr. Homework / Day	62.7	65.0	59.3	1 Hr. Homework / Day	16.7	18.0	15.0
2 Hrs. Homework / Day	35.8	35.0	37.0	2 Hrs. Homework / Day	52.2	50.0	55.0
3 Hrs. Homework / Day	0.0	0.0	0.0	3 Hrs. Homework / Day	22.2	24.0	20.0
4 Hrs. Homework / Day	0.0	0.0	0.0	4 Hrs. Homework / Day	7.8	8.0	7.5
More Than 4 Hrs. HW / Day	1.5	0.0	3.7	More Than 4 Hrs. HW / Day	1.1	0.0	2.5
Time on Extra-Curricular Activities				**Time on Extra Curricular Activities**			
1 Hr. / Day	22.4	32.5	7.4	1 Hr. / Day	20.0	20.0	22.5
2 Hrs. / Day	29.9	25.0	37.0	2 Hrs. / Day	35.6	32.0	40.0
3 Hrs. / Day	19.4	10.0	33.3	3 Hrs. / Day	26.7	36.0	15.0
4 Hrs. / Day	7.5	7.5	7.4	4 Hrs. / Day	5.6	4.0	7.5
More Than 4 Hrs. / Day	20.9	25.0	14.8	More Than 4 Hrs. / Day	11.1	8.0	15.0
Home Computer (PC)				**Home Computer (PC)**			
Students with Computer (PC)				Students with Computer (PC)			
at Home	65.7			at Home	77.8		
Students without Computer (PC)				Students without Computer (PC)			
at Home	34.3			at Home	22.2		
Use of Home Computer				**Use of Home Computer**			
Can Use Home Computer at				Can Use Home Computer at			
Any Time	47.8	52.5	40.7	Any Time	72.2	74.0	70.0
Video Game at Home				**Video Game at Home**			
Have a Video Game at Home	64.2	65.0	63.0	Have a Video Game at Home	47.8	62.0	30.0
Homework to be Done at Certain Times				**Homework to be Done at Certain Times**			
Parents who require homework to				Parents who require homework to			
be done at certain times	46.3	50.0	40.7	be done at certain times	41.1	36.0	47.5
Frequency of Movie Going				**Frequency of Movie Going**			
Twice a Week	11.9	12.5	11.1	Twice a Week	5.6	2.0	10.0
Once a Week	19.4	25.0	11.1	Once a Week	18.9	24.0	12.5
Twice a Month	29.9	22.5	40.7	Twice a Month	32.2	28.0	37.5
Once a Month	28.4	22.5	37.0	Once a Month	35.6	38.0	32.5
Once a Year	9.0	15.0	0.0	Once a Year	7.8	8.0	7.5
Sometimes	1.5	2.5	0.0	Sometimes	0.0	0.0	0.0
House of TV Watched / Day				**Hours of TV Watched / Day**			
1 Hr. / Day	47.8	42.5	55.6	1 Hr. / Day	45.6	50.0	40.0
2 Hrs. / Day	19.4	25.0	11.1	2 Hrs. / Day	27.8	20.0	37.5
3 Hrs. / Day	22.4	22.5	22.2	3 Hrs. / Day	21.1	26.0	15.0
4 Hrs. / Day	9.0	7.5	11.1	4 Hrs. / Day	2.2	4.0	0.0
5 Hrs. / Day	0.0	0.0	0.0	5 Hrs. / Day	3.3	0.0	7.5
6 Hrs. / Day	1.4	2.5	0.0	6 Hrs. / Day	0.0	0.0	0.0

TABLE 1. PERCENTAGE CHART

AGE GROUP: 7.0 TO 9.11 YRS.				AGE GROUP: 10.0 TO 14.10 YRS.			
Item Description	Total %	Boys' %	Girls' %	Item Description	Total %	Boys' %	Girls' %
No. of Books Read				**No. of Books Read**			
Per Week	2.7	3.4	1.7	Per Week	1.7	1.2	2.4
Per Month	7.8	9.8	4.9	Per Month	5.9	4.6	7.4
Per Year	103	135	55.6	Per Year	51.3	42.1	62.8
Time Spent on Homework Per Day				**Time Spent on Homework Per Day**			
No. of Hours / Day	1.41	1.34	1.52	No. of Hours / Day	2.24	2.22	2.27
Time Spent on Extra-curricular Activities				**Time Spent on Extra-curricular Activities**			
No. of Hours Spent Per Day	2.75	2.67	2.85	No of Hours Spent Per Day	2.49	2.48	2.50
Home Computers No. of Hours Spent on Computer Per Day	0.89	1.02	0.69	**Home Computers** No. of Hours Spent on Per Day	0.80	1.06	0.46
Video Game at Home No. of Hrs. Video Game Played at Home	0.5	0.5	0.5	**Video Game at Home** No. of Hrs. Video Game Played at Home	0.3	0.4	0.2
Video Game Out of Home No. of Hrs. Video Game Played Out of Home	0.6	0.7	0.5	**Video Game Out of Home** No. of Hrs. Video Game Played Out of Home	0.4	0.6	0.1
Hours on Home Computer No. of Hrs. Computer is Used After School	0.7	0.7	0.6	**Hours on Home Computer** No. of Hours Computer is Used After School	0.8	1.1	0.4
Hours of T.V. Watching No. of Hrs. Spent Per Day	1.9	2.0	1.7	**Hours of T.V. Watching** No. of Hrs. Spent Per Day	1.9	1.8	1.9

TABLE 2.   AVERAGE CHART

(28%), Facts of Life (26%), Three's Company (21%), and Golden Girls (20%).

Favorite Leisure Time Activities: Table 3 includes data on this item. The top 8 leisure time activities reported were: T.V. (49%), reading (40%), computer (26%), swimming (22%), play with friends (19%), bicycling (15%), movies (14%), and tennis (13%).

The subjects generally reported watching fewer hours of T.V. a day than the national average. Research generally shows that children with higher IQs watch less television than children with lower IQs.

This study found that some leisure time activities that were reported by these subjects are typical of their age group, e.g., television viewing and movie going. However, reading was reported by a high percentage 40%. It is also interesting to note that these gifted children show a traditional interest in school or academic activities, to include the use of computers and other creative activities. Gifted children are also generally advanced in their reading development

ITEM DESCRIPTION	TOTAL %
If you read the newspaper, what part of newspaper do you read?	
COMICS	73.25%
NEWS	57.32%
OTHER	42.04%
SPORTS	28.03%
BUSINESS	1.27%
My favorite school subject is:	
MATH	28.03%
P.E.	21.66%
ART	13.38%
THEATRE ARTS	7.64%
SCIENCE	5.73%
ENGLISH	5.73%
SPANISH	4.46%
LATIN	3.18%
HISTORY	2.55%
Favorite T.V. show:	
COSBY SHOW	58%
FAMILY TIES	36%
DIFFERENT STROKES	28%
FACTS OF LIFE	26%
THREE IS COMPANY	21%
GOLDEN GIRLS	20%
CHEERS	19%
SILVERSPOONS	17%
CARTOONS	16%
MIAMI VICE	15%
Favorite leisure time activities:	
TELEVISION	49%
READING	40%
COMPUTER	26%
SWIMMING	22%
PLAY WITH FRIENDS	19%
BICYCLING	15%
MOVIES	14%
TENNIS	13%
PIANO	12%
SLEEP	11%
BASKET BALL	10%
DRAW OR PAINT	10%
EAT	8%
DANCING	7%
BASEBALL	6%
TALKING ON TELEPHONE	6%
LISTENING TO MUSIC	5%
VIDEO GAMES	5%

TABLE 3.   DESCRIPTIVE ITEMS PERCENTAGE CHART —
TOTAL NO. OF SUBJECTS: 157

and are instructed by parents and teachers to read a wide assortment of materials.

Leisure time and play are important concepts in American society for all children. It is uniquely important for us to learn more about the attitudes of gifted children toward leisure time activities, school-related courses for which they have a preference and the home and community based activities that occupy their time.

Super Saturdays, Sometimes & Somewhere

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Super Saturdays, Sometimes and Somewhere began in the Boulder Valley Schools in Colorado in the 1982-83 school year and the programming effort has continued ever since. Although it has developed in quite a different direction, the initial idea had its roots in the extra-school programming of John Feldhusen (1982) at Purdue University. Feldhusen pointed out that gifted, creative, and talented students have special educational needs which can be met in part through extra-school services provided on Saturdays, summers, evenings, and weekends.

Certainly many needs of gifted students are met in the school and in the home. Gifted students have cognitive needs which include the opportunity to develop basic thinking skills early, to engage in in-depth inquiry, to work with inter-disciplinary problems, to learn research and analysis techniques at an early age, and to be self-directed in their learning. Their special affective needs include acquiring motivation through the association with intellectual or artistic peers and by being in contact with adult models who are creatively successful individuals. Gifted students also have generative needs. They are not merely receivers of knowledge and skills but rather tend to invent and create new approaches for identifying and solving problems.

Extra-school programs designed for gifted and talented youth should consider all three types of needs mentioned above. Research into persons who have had notable achievements as adults reveals that very early they were exposed to a wide variety of stimulating experiences and that they began to focus on specific areas of endeavor. For the most part they showed sustained motivation and did not burn-out of their early enthusiasms. (Bloom, 1989).

Capitalizing on needs of gifted youth, John Feldhusen was instrumental in introducing a Super Saturday program at Purdue University involving non-credit mini-courses designed to present material at a fast pace and at an advanced level for children who would score in the top 10% of their student populations.

In Boulder, Colorado, it was thought that the University of Colorado might provide the same sorts of opportunities for youth that Purdue University had offered. This did not materialize. So the Office of Talented & Gifted Education in Boulder decided to begin a Super Saturdays program on its own without University sponsorship. The concept was expanded from Saturday offerings on a university campus to activities during any out-of-regular-school hours in any appropriate setting. Super Saturdays, Sometimes and Somewhere was born!

ECIA Chaper II, Block Grants funds were made available to districts through the state of Colorado, and the Office of Talented & Gifted Education applied for $10,000. The grant was approved. The intent of the Boulder Valley proposal was to support enriching activities in any content field or multidisciplinary, and at any grade level, for talent development of students outside of the regular school day. It was anticipated that there would be offerings on Saturdays, afternoons, evenings, and during periods of school vacation. Monies that were available would pay teachers, consultants, aides, and provide needed materials. Students would not be assessed any fees for their participation.

After considerable discussion, a bold decision was made. Anyone in the community might apply to hold a Super Saturdays & Sometimes by simply writing a letter describing the idea, target audience, goals, time-line, and budget. No forms would be used. No deadlines for application were set. Applications would be received and approved so long as money was available. The program was advertised widely in the community, and a committee of three persons agreed to

read the letters of application and to approve or disapprove of the proposals. Very quickly, letters began to arrive.

A Denver television Channel was willing to show a program called "Spotlight on Schools," to be planned, written and narrated by elementary students as a Super Saturdays project. The second proposal came from a Junior High music teacher who asked to offer four Thursday evening sessions of music using cortols and recorders. Thirty-six students, grades 5 through 12 would take part. The third proposal was submitted by a senior high drama teacher who proposed that 50 students in grades 9 through 12 would work on two successive Saturdays with nationally known artists, Nancy Spanier and Paul Oertel, in dance, movement and voice techniques. The fourth proposal was submitted by an elementary teacher who proposed taking 20 students from fifth and sixth grades who were especially interested in publishing on an afternoon when school was released for parent-teacher conferences to visit Johnson's Publishing Company to have a first-hand view of the printing of books.

The staff of the University of Colorado became involved when Professor Robert Christopher offered a series of lectures, labs, and field trips on Thermodynamics, and Professor Igor Gamow fascinated 20 secondary students with four workshops on the Bio-engineering Aspects of Animal Performance. Other colleges in the area were also informed of the need and opportunity, and Professor Ray Meester of Front Range Community College presented a Geometric Light Show for elementary students, demonstrating geometry and lasers.

In all that first year, eighteen proposals were received and fourteen were funded. Encouraged by success, funding was continued for the 1983-84 school year, but due to a diminishing budget, was limited to $5,000. The second year began with a request to take thirty-six kindergarten students to hear the Denver Symphony in a special Tiny Tots concert. Another group of kindergarten students were funded to attend a performance of Snow White & Rose Red at the Arvada Center for the Arts & Humanities. Thirty additional kindergarten students attended a performance at the Bonfils Theatre. It was readily apparent that although none of the proposals during the first year were for kindergarten level, that the second year was going to make up for it.

Three dozen students in grades 9 through 12 participated in crea-

tive writing workshops for three successive Saturdays. Six published writers from the Boulder area each worked with six students. Each guest author was paid $75 for each three-hour session.

An aide at an elementary school who was an opera buff, proposed teaching children about opera, helping them perform an original opera, *Pandora's Box*, with the creator Cecil Effinger available for comment and to see the production, presenting scenes from Gilbert and Sullivan's "Trial By Jury" as a puppet show, attending "la Boheme" at the University of Colorado, and finally attending a professional opera performance of "The Elixir of Love" at Central City during the summer festival.

A costumer was hired to create the unusual characters of *Alice in Wonderland*, helping each senior high student come up with a special creation. The cost for this professional help was $400. Local artists provided a series of workshops in papermaking. A film critic was hired to work with secondary students to see THRONE OF BLOOD, a Japanese production, and to compare it with the English version of MACBETH. In all, 15 proposals were received and 12 funded during the second year at a cost of $5,196.54.

Super Saturdays, Sometimes and Somewhere continued every year from its beginning in 1981 through 1988. Each year the type and number of proposals varies. During the 1986-87 school year, twenty-nine proposals were funded. Over a thousand students are involved in Super Saturday, Sometimes & Somewhere programming each year. Monies to support the programming range between $5,000 and $10,000. This activity is one more way of helping to meet the needs of our talented and gifted youth.

Project Chameleon, Project Challenge, and Project Communicate: A Tri-Focal Approach Toward Meeting Exceptional Needs

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The Lodi School District in Lodi, Wisconsin has developed a tri-focal approach to programming and meeting the needs of elementary students (K-6) who exhibit gifted, talented, and creative behaviors. Each of the programming options is very vital, and each is very different from one another.

I. *Project Chameleon*
Resource room, Cross-grade groupings, 8-10 students, scheduled four hours per week. Students identified because of educational need which cannot be met in the classroom setting.

Identification: Students are rated by classroom teachers in ten categories:
A. Visual Arts Talent
B. Performing Arts Talent
C. Creative Talent
D. One-Sided Talent
E. Academic Talent
F. Leadership and Organizing Talent
G. Psychomotor Talent
H. Spatial and Abstract Thinking Talent

I. Underachievement Talent

J. Hidden Talent

(Taken from Kranz Multi-Dimensional Screening Device)

Each individual student is rated in each category in comparison to others within homeroom setting.

Rating scale values - 1 (low) - 7 (high)

Students receiving three or four high ratings (6's or 7's) are placed in the first Pool.

Data such as work samples, test scores, teacher questionnaires, pupil interest surveys, parent nominations and classroom observations, are collected on students comprising this *First Pool*.

The Screening / Identification Committee is made up of the Principal, Guidance Counselor, School Psychologist, Art, Music, and Physical Education teachers. This committee carefully scrutinizes the collected data and recommends students for Project Chameleon. Usually 3-5% of the screened population is recommended for Project Chameleon. These are students whose needs are not being met in regular homerooms. Information and recommendations are presented to parents who make the final decision whether or not to enroll a student in Project Chameleon.

Project Chameleon occurs in a pull-out resource room. Students work at Higher Level Thinking Skills such as Brainingstorming, Visual Imagination, Divergent Questioning, Deductive Thinking, and Creative Problem Solving. These are integrated into Thematic Units. Also, a guidance component works on self-awareness.

II. *Project Challenge*

This is an enrichment program with a variety of mini-unit offerings.

Students are selected from the *First Pool*, or any student may self-select.

Mini-unit Examples:

Writers Workshop: Fifth and sixth grade students with above average writing ability, task commitment, and creativity. One hour per week, after school. Students wrote of happenings around school, interviews of teachers and students, etc. or wrote poetry, editorials, or short stories. Articles were published in local, weekly newspaper.

Creative Problem Solving: I taught creative problem solving techniques to all third grade students. Approximately 100 students in four classrooms. Eight weeks, one hour per week, per classroom.

Foreign Culture Club: Using AFS and Rotary Exchange Students from a local high school, after-school clubs gained knowledge of foreign languages and cultures. Open to third and fourth grade students.

III. *Project Communicate*

Dissemination of information, knowledge and resource materials.

Learners exhibit gifted behaviors at times other than when they are scheduled into a resource room or involved in an interest / enrichment unit. It is very important to work with and through classroom teachers.

Inservicing and staff development instruction in Higher Level Thinking Techniques is for teachers to use in the classroom with all students. Also Project Communicate is vital in supplying resources to classroom teachers.

Project Chameleon, Project Challenge, and Project Communicate are all vital to our comprehensive programming in meeting the needs of the gifted, talented, and creative learners at Lodi Elementary School.

Extending Humanistic Wholistic Teacher Training for the Gifted: Identifying the Gaps, Consolidating the Gains

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The recent literature on training teachers for the gifted has begun to focus less on the extravagant lists of perfect and desirable qualities which teachers of the gifted should possess, and concentrate more on the *possibilities* of change, and the most needed areas in which change should take place.

Shiner (1986) has outlined a program of training teachers for the gifted which embraces humanistic, holistic instructional strategies. A training guide was devised (1986) which helps an instructor to assess beginning attitudes and conditions necessary to teach the gifted in the humanistic mode. This report shall discuss the information received from utilizing this Guide with a number of teachers of the gifted. It will also discuss the further teacher-training program that was devised to consolidate the gains made in the initial teacher-training experience. Theories of social learning were employed to design learning experiences which would instigate effective change beyond the "instructional stage" within these learners.

All participants of Gifted, Part II needed to have successfully completed Gifted, Part I. Participants had a variety of experiences, including full-time teachers of a segregated classroom, partial withdrawal itinerant teachers, consultants, psychologists, or administra-

tors. This sample of students therefore had both more theoretical and practical experience than the groups of students in Gifted, Part I.

Early discussions in the course revealed that most participants felt weak in two major areas. Firstly, they needed further clarification about successful implementation strategies for a differentiated curriculum. Secondly, most participants requested training in specific counselling strategies, to increase the interpersonal effectiveness of themselves and their students.

Although many teacher-training models for the gifted may implicitly reflect a social learning perspective, I believe that the present course of instruction is the first to be so closely modeled on this theoretical perspective. Social Learning Theory (Bandura, 1977) has a particular relevance to gifted education for the following reasons: (1) It stresses the complexity of human behaviour. (2) It places the learner in a highly interactive, decision making role, rather than as a passive respondent. (3) It reflects cognitive, affective, symbolic and environmental factors in the learning process. (4) There is a strong emphasis on individual intentionality and individual learning needs. Gifted, Part II incorporated certain constructs of Social Learning Theory. The importance of self-concept, conditioning, reward and group membership were selected by this author to be of particular significance. Participant Modelling was also selected as a key feature for effective learning transfer. Attention was paid to four major components of participant modelling: (1) explanation of the rationale and instruction,(2) modelling, (3) guided participation, and (4) successful experiences.

The following section describes a variety of activities in Gifted, Part II which were designed to reinforce the structure of participant modelling.

Rationale and Instruction

The instructor reinforced the specific values and attitudes about giftedness that had been stressed in Part I (e.g., the gifted are different, NOT special; the gifted differ widely in terms of personality profiles and preferred learning environments etc.) Students were encouraged to designate their own research areas and projects, either related to counselling or curriculum. Most students preferred to work on curriculum units which they designed reflecting differentiated principles suited for the gifted populations with which they were in-

volved. These projects were shared and discussed during class time. Critical and supportive feedback was exchanged between students. Plans to develop a Handbook of some excellent teaching models is currently being developed by the author.

I also consciously modelled as many of the "good teacher of the gifted" characteristics as possible (humour, empathy, keen interest in learning, "sage on stage vs. guide by side", etc.)

Symbolic Modelling

Films, audio and video recordings, slides, imagery scripts, printed material and bibliotherapy are all effective tools to assist in symbolic modelling of desired behaviours. In Gifted, Part II, several videos which exemplify creative thinking skills (e.g. *Olympics of the Mind)* or gifted personalities (e.g. *The Colors of Love, Story of Marc Chagall,* or *How Do the Gifted Grow)* are utilized. Students were encouraged to read biographies of gifted people in their particular fields of interest (e.g., English teacher read biography of Virginia Wolf).

Self as Model

Self-growth was monitored through journals, self- videotape, and recorded case studies with a gifted individual. All students in the course participate in five one hour counselling sessions, facilitated by the instructor. Participants are taught a variety of techniques including active listening, goal setting, confrontation, identifying self-defeating behaviours, focussing, creative dreaming, avoiding perfectionism etc.

Guided Participation

Evaluation for the course is designed by the participants. They are helped to design a procedure which reflects as many aspects of differentiated curriculum for the gifted as possible. The final design generally combines elements of peer, self,and instructor feedback on a variety of cognitive and affective course elements. Feedback is both formative and summative, although the final course grade reflects the standardized Letter Grade which the University Graduate School requires.

Successful Experiences

Bandura stresses that clients must experience and identify their successes, if they are to retain the benefits of their new learning. In Gifted, Part II, students are constantly encouraged to articulate positive changes they see in themselves and others through journals, counselling sessions, discussions, etc.

How does assessment of the "success" of social learning therapy take place? Bandura suggests that final assessment does not take place until some time after termination of therapy. If after an acceptable period of time, the clients are still practicing the desired new behaviours in their natural environments, then the social learning therapy can be considered successful. About 75 participants have thus far experienced Gifted, Part II. Feedback on experienced changes have been in two general directions: more comfort with a wide spectrum of gifted learners in general, and themselves as gifted learners in particular; and greater familiarity with the constructs of experiential, student-directed learning and with themselves as facilitators.

Since 1985, the Gifted Teacher Training Guide, described in Shiner (1986) has been given as a pre and post-test to about 30 students. In all cases, directions of all aspects of the questionnaires proceeded from an average ranking of 2-3 in most test areas (weak) to a majority of responses in the 4-5 area (strong) after the completion of Gifted, Part II. These rankings related to growth in both cognitive, affective and implementation skills. It is also encouraging, that many graduates of these two training courses in Gifted Education have risen to supervisory and developmental postions with gifted education in their own jurisdictions.

HUG GUIDE (Humanistic Utilization Guide)

The following criteria can help you assess your practical readiness to make humanistic education for the gifted a reality. Rank yourself on each statement (1 = weak to 5 = strong) and give a specific example from the last six months of your activities that supports your actions.

1. I can define who the gifted are in one short, clear and practical statement.
1 2 3 4 5
Example:

2. I can make a clear and practical statement about the need for differentiated programs for the gifted.
1   2   3   4   5
Example:

3. I can define "differentiated gifted instruction" with six or seven clear criteria.
1   2   3   4   5
Example:

4. I am more frequently a "guide by the side" than a "sage on the stage" in my daily classroom practice.
1   2   3   4   5
Example:

5. I am continuously practicing my active listening and communicating skills with my students.
1   2   3   4   5
Example:

6. I frequently hold class meetings and small discussion groups with my students about class business and personal development concerns.
1   2   3   4   5
Example:

7. I help my students develop self-rating scales for self-esteem and positive health growth (e.g. perfectionism scale; procrastination scales etc.)
1   2   3   4   5
Example:

8. I have an exciting collection of visuals and books about personal growth which are freely accessible to my students.
1   2   3   4   5
Example:

9. I am always adding up-to-date media and newly available materials to update my present collection about the gifted.
1   2   3   4   5
Example:

10. I discourage comparative evaluations of students' work, but I encourage that they share with each other for mutual enrichment.
1 2 3 4 5
Example:

11. I encourage students to develop their own record-keeping of progress, both cognitively (self-evaluation on projects etc.) and affectively (journal keeping; small discussion groups with peers etc.)
1 2 3 4 5
Example:

12. I have several ways to gain feedback about the students' involvement with and enjoyment of the course as it is progressing.
1 2 3 4 5
Example:

13. I solicit written evaluations and positive support documents (e.g. " Write an ad for this course".) from my students at the course end.
1 2 3 4 5
Example:

14. I keep "small and quiet" about my innovative gifted program with my colleagues, and show interest in their programs and different styles of teaching.
1 2 3 4 5
Example:

15. I keep my principal informed of any unusual aspects of my program (e.g. out-of-class work-time; qualitative reporting) and offer to handle parental concerns myself.
1 2 3 4 5
Example:

16. I involve my students in positive community projects that will bring credit to the school as a whole.
1 2 3 4 5
Example:

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The Development of the Whole Person Through Liberal Education: What We Know and (Sometimes) Do

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As faculty, we search constantly for ways to improve our teaching, our courses, and undergraduate education as a whole. Excellent reports like Carnegie's *College: The Undergraduate Experience in America* (Boyer, 1987), have provided some insight, information, and a good deal of stimulation. Other works, like Allan Bloom's popular *Closing of the American Mind* (1987), focused national attention on undergraduate education and generated controversy aplenty. These and other works push me to reflect: What do we actually know about the effects of undergraduate education and the factors that make a difference in what students take away from their college years? In the paragraphs following, I highlight the fruits of my recent search of the literature for knowledge currently available on this subject. A short section is added at the end in order to list 17 elements that affect the quality of undergraduate education.

A variety of studies have demonstrated that the quality of undergraduate education is not directly related to the resources a college or university invests in it (e.g. the size of budgets, the qualifications of faculty, the number of books in the library) or the distinctions or awards won by alumni. The best gauge of our educational punch, it would seem, is the *difference* in students' knowledge, values, confi-

dence, and competence between admission and graduation. But by far the most important factor in predicting alumni success is the rigor of an institution's *admissions standards*: high achieving freshmen turn into high achieving and successful graduates. Thus, the distinction of Harvard's or Oberlin's graduates has less to do with the quality of their faculty , the size of their endowments, or the facilities they offer than it does with the academic qualifications of the students they choose to admit. Good open admissions institutions, then, have the potential to make more difference in the lives of their students than do selective colleges and universities. But admitting better students does make a school *look* better.

It also behooves us to reflect that neither grade point average nor standardized test scores (ACT, SAT, GRE, etc.) are good predictors of career and personal achievement later in life. They are not even good predictors of success in graduate school. Howard Gardner (*Frames of Mind*, 1983) explains these disquieting observations by reminding us that academic institutions are devoted pimarily to the development of verbal and mathematical intelligences. Yet his celebrated cross-cultural studies show that spacial, musical, kinesthetic, intra-personal and inter-personal "intelligences" play vitally important roles as we make our way in the world.

More disquieting news. A pioneering study *Changing Values in College*, published in 1957 by P.E. Jacob, reviewed twenty years of empirical studies of colleges, their curricula, and their students. Jacob concluded that the influence of college on students' beliefs and values were quite modest: "the values of American college students are remarkably homogeneous . . . and the great majority of students appear abashedly self-centered . . .There is more homogeneity and greater consistency of values among students at the end of their four years than when they begin. Fewer seniors espouse beliefs which deviate from the going standards than do freshmen." Jacob continued, "to call this process a *liberalization* of students values is a misnomer. The impact of college experience is rather to socalize the individual, to refine, polish, or shape-up his values so that he can fit comfortably into the ranks of American college alumni." Controversial as this book was, and distant as it now is, it reminds us that the effects of college on students are too often *ill-liberal* in that they can dampen rather than encourage creative thought and independent moral judgment. Single-minded devotion to covering the intellectual territory of

our disciplines can make us vulnerable to the risk of "schooling" our students in the prevailing methodoligies and ideologies—usually of our particular corner of the academy.

If we are to measure our success, therefore, in the amount of overall growth our students experience, and the extent to which we liberate and encourage their creative instincts, what factors might we consider? Scholars have generally relied on two kinds of evidence: (1) high grades and high achievement on standardized tests and (2) documented advances in:

- critical thinking (analysis, synthesis, etc.)
- ethical reasoning (reflective judgment)
- intellectual flexibility (ability to consider and deal with ideas and information that challenge one's assumptions or personal values).

Grades and test scores obviously have more to do with a student's acquisition of information and knowledge (and have the shortcomings already discussed), while the latter factors address matters of intellectual and emotional maturation.

Literally thousands of studies in the last thirty years have searched for factors in undergraduate education that explain high gains in academic achievement or notable personal growth in critical thinking, ethical reasoning, and intellectual flexibility. From Pascarella (1985) and various others, I have pulled together the more noteworthy results:

- There is little evidence that curricular design itself is the key factor in either cognitive or affective growth. How hard students work in their classes, and the amount of interaction they have with faculty and fellow students, have much more influence on student achievement.
- Students achieve more and grow faster when they take courses from faculty whom they perceive as being interested in teaching.
- When given prompt, detailed critiques of their work, students respond with higher commitment and better performance.
- The frequency and quality of non-classroom interactions with faculty also make a big difference—especially if the conversations with faculty are about intellectual and social issues or career planning.
- Students in colleges and universities that have relatively "flex-

ible curricula'' (that provide students reasonable options to choose their courses and shape their own education) show greater growth.
- Students who are *undecided* about their majors during their first year or two show greater growth in achievement than those who make early commitments to majors.
- Students' elective choices differ somewhat by academic majors. Humanities students tend to avoid math and science courses and take most of their electives within the humanities. Science students tend to take their electives in the humanities and social sciences. Social science students, like science students, tend to take their electives outside their own area.
- Bright students advance more rapidly when they live and study with other bright students. And low-aptitude students usually advance more quickly when they study and live among high-aptitude students. Happily, low-aptitude students don't seem to impede the process of high-aptitude students.
- Students' intellectual growth is positively related to the intensity of the intellectual and cultural climate of the campus.
- Housing environments do make a difference — for example, residence halls and social fraternities in which most students place high value on serious study, academic activities, and intellectual issues show significantly greater growth.
- Students who work *on campus* tend to have higher than normal academic achievement, but students who work *off campus* have lower than normal acadmic achievement.
- Students who *live* on campus tend to show greater intellectual and ethical growth, whereas students who live at home tend to have lower than normal growth.
- Other things being equal, students at large colleges and universities show greater academic growth than those at small institutions.

If we wish to stimulate the best in undergraduates, both in terms of standard measures of academic progress and in intellectual and ethical maturity, there is no doubt that we must treat students as individuals, spend time with them outside the classroom, critique their work promptly and candidly, approach our teaching in a way that taps our joy in the life of the mind, and make every reasonable effort to span the yawning gaps between thought and behavior, campus and community. How we design the curriculum, and what we put in it, re-

mains important — but the best design in the world is of little value in the hands of uninspired teachers — and the most enduring works of science and literature provide little inspiration in the minds of harried or passive students whose lives outside the classroom remain disconnected from or antagonistic to academic values. We hear an unequivocal voice from the research literature: Our students need more from *us*. They need our time and they need to sense our commitment to open inquiry and enduring ideas. We will do well to keep these research findings in mind, and to debate them, as we embark upon the campus-wide task of improving undergraduate education.

Elements That Affect the Quality of Undergraduate Education

1. *Recruitment* (what students are *sought* and how?)
2. *Admissions* (criteria & standards for entry to majors as well as entry to the university in general)
3. *Academic Advising* (freshman orientation, lower division and majors—variously by professional advisors, faculty and informally by peers)
4. *Housing* (residence halls, apartments, with family, etc.)
5. *Finance* (family, work, loans, scholarships)
6. *Curriculum* (liberal education, majors, allied hours, electives)
7. *Faculty* (qualifications, morale, commitments, availability to students, etc.)
8. *Teaching* (faculty selection & support; instructional philosophy and techniques)
9. *Tests and Examinations* (What for: information, understanding, or creativity? By whom? How often? Ways and means of grades and grading?)
10. *Libraries and Laboratories* (well stocked, up-to-date, enough capacity for student needs?)
11. *Student Services* (minimize bureaucratic impediments, provide information, support academic and social development?)
12. *Activities & Cultural Events* (clubs, concerts, lectures, athletics, etc.)
13. *Community Involvement* (internships, field studies, memberships in voluntary social service, political, and other organizations, etc.)
14. *Graduation Requirements*

15. *University Organization and Leadership* (institutional values and priorities)
16. *Student Participation in Campus Governance* (University committees, student government, etc.)
17. *Placement* (after graduation)

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Liberal Education, Self-Perception, and Preparing for Careers

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University of Utah

Overview of the 1987 Doctoral Dissertation

As they select their college major, many students feel pressured to choose a field of study which will "guarantee" a good job. The overflow of applicants to our colleges of business and engineering attest to this fact. Students, who would otherwise pursue a liberal education to expand their interests and develop their multiple talents, are frequently subjects of a premature narrowing and specialization brought about by the pressure of the question, "What kind of a job can you get with this major?" Idealistic motivation to learn for learning's sake is thus challenged by the reality of the employment world, e.g., the number of Ph.D.'s driving taxicabs. How can education deal with this issue: supporting students' need for jobs while maintaining support for education for multiple talents?

Studies of college graduates suggest that job-conscious students may have more freedom to select the major of their choice than the publicity, around the so-called "unmarketable" majors, would have us believe. Research indicates that graduates from all majors can enjoy greater success in the job search if they identify themselves to employers — *not* in terms of their major, grade point average, personality, or even previous work experience — *but* in terms of specific skills which clearly relate to the job they seek.

The Study and Its Results

The purpose of this study was twofold: (1) to investigate the way 150 University of Utah liberal arts graduates perceived their *Strong-est Job Qualifications* (SJQ) as they began their job search, and (2) to analyze the correlation of these perceived SJQ's with two criteria of success, namely, the length of job search and the salary received. It was speculated that those who designated specific skill as their SJQ would achieve a higher ratio of success than those who cited academic or general qualifications.

A questionnaire was mailed to all liberal arts graduates who met four criteria: (1) registration with the University's Placement Center during 1982-85, (2) termination of education at the baccalaureate level, (3) full-time employment sought immediately after graduation, and (4) an available address. Of the 857 potential registrants, 432 met these eligibility requirements; 150 of them returned valid and usable responses (37%).

Subjects were asked to designate which of six variables they had perceived to be their SJQ as they began their job search. The six variables were: Grade Point Average, College Major, Personality in General, Previous Work Experience, Specific Skill, or "other" qualifications. Because subject responses were given in retrospect, they were checked for validity through use of a control group. Very little difference was noted between responses of the subjects and the controls.

Data were subjected to correlation studies, factor analysis, and variance analysis through Beta r products. Much complexity was discovered. Therefore more discriminating criteria were established for a fourth analysis: a study of extreme parameters of success (or lack of it). Finally, a fifth analysis contrasted students' self-perceptions of their SJQ as they began their job search with those held after a short period of employment.

Although correlation does not equate with causality, the data collected suggest good support for articulation of job competencies in terms of specific skill versus the more general or academic variables. After a short period of employment, not even one subject cited GPA as a SJQ, but the number citing specific skill increased by 133%. Previous work experience was expected to show high positive correlation with success. Instead, it figured prominently among both high and low success score. Personality also showed a dual-impact, suggesting that it may have been used alternately as a term for leadership/pro-

ductivity (a success factor which out-scored all others in this study) as well as for a rather naive, vague, and general cover-up for lack of skill awareness. College major frequently associated with lack of success, underscoring the need for a more explicit articulation of relevant job competencies than is immediately obvious from the title of the major itself.

Editorial Comments: Implicit in these findings is a strong encouragement for Liberal Arts graduates seeking employment to develop and to learn to market their relevant career competencies and not just their academic accomplishments.

Also, the following February 28, 1989 letter from Dr. Mark Fritz raises issues relevant to those which Jean Zmolek had investigated two years earlier in her 1987 doctoral dissertation:

Dear Colleagues:

As a university professor, I am confronted with the very same problem each year.

Students are heading to private business after their final exams, full of theoretical knowledge, but lacking those skills inevitable to 'market' this knowledge and themselves, respectively. The consequence: most of them don't find an appropriate job or lose it after a short time—because of this deficiency.

Therefore, I would like to ask you as experts if you could furnish me graciously with some elaborations prepared on these issues at your institution, and also some book references for going into more detail, if possible.

Thank you indeed for your highly appreciated cooperation in advance.

Sincerely yours,

/signed/

Mark Fritz
D-8240 Berchtesgaden, West Germany

A Wholistic Model for Developing Life Competencies

Grover Young
Holt Public Schools, Holt, Michigan and
Robert T. Hayduk
Warren Consolidated Schools, Warren, Michigan

This paper presents a synthesis of four dimensions of human potential integrated to create life competency. The four dimensions are knowledge, talents, wellness and values. When these four dimensions are fully developed and integrated, human beings are able to function at their maximum competence.

Too often in education the Band-Aid approach is used where programs are simply added on in order to satisfy the current need. These programs are then conducted in isolation with little thought given to what the ultimate outcomes of education should be. The model presented in this paper, however, provides for the integration of human abilities and focuses on life competencies rather than isolated facts and skills. It provides a framework for integrating what is known about human abilities into the whole school program.

The model can be used for staff development and also as a focus for the education of students. The first priority for staff development is to establish a wholistic mind set. The next task is to provide staff with an understanding of what it means to be "Talent Developers" as well as "Knowledge Dispensers" (Taylor, 1985). Then the staff needs to develop curriculum by deciding what knowledge is essential for students to learn and how to impart that content while simultaneously developing lifelong talents.

Education might be defined as the process of developing one's own operators manual for the maximum utilization of the mind/body system, or even more simply, it could be defined as the process of developing the whole person.

A current trend is to deal with wholistic concepts, and most of us could agree that the education of the whole person is a fundamental educational objective. Most of us could also agree that this objective is far from being achieved in our present educational settings.

The models that we use for curriculum development and instructional delivery are more fragmented than whole. Knowledge and skills are more isolated than integrated.

Even more disturbing is the fact that our models for teaching, learning, professional development and personal development have little to do with one another. For some, even the wholistic trend has created one more thing to be added to an already overloaded yet fragmented educational program.

This paper suggests that one solution to achieving wholistic education is to embrace a single model that is applicable to personal development, professional development, and the design of curriculum and teaching strategies. Therefore, it suggests that the life competencies we want to develop in the educated whole person are the very things we want for ourselves personally and professionally.

There is nothing particularly new in the parts of the model suggested and it is possible that other representations of wholistic models might work just as well. The key in considering such a model is acceptance. It must first be acceptable as a model for personal development and because of its value to us in maximizing our personal potential, it can be valued as the means to organize our approach to maximizing the potential of others.

The wholistic model for developing life competencies consists of four dimensions that dynamically interact with each other as illustrated by Figure 1. In order for a person to be fully competent he/she must strive for a balance among these dimensions. It is a dynamic process of becoming that requires constant monitoring and adjustment. An analogy of an automobile would be helpful in which *Life Competencies are the car—Knowledge, talents, values, and wellness are the four tires.*

When one is cruising at 55 m.p.h. and the tires are in proper alignment, balance, and equally inflated, the car hums down the highway very smoothly. If one of the tires becomes out of whack, it might bump or pull the car to one side causing you to stop in order to

determine what had gone wrong. Perhaps one of the tires proves to be underinflated. Air can be added to that tire and you can be back on your way, once again smoothly humming down the highway.

Knowledge, wellness, talents, and values work much the same way while one cruises down the highway of life. If all four dimensions are in balance and interacting smoothly, one is functioning at full competence. If a person has a great deal of knowledge but does not have the right talents, he/she will not be fully competent. If a person has knowledge and talents, but lacks wholistic wellness, he/she will not be in balance. If a person has knowledge, talents, and wellness, but applies these to a task that is not valued, he/she will not be fully competent. There must be an integrated balance of all four dimensions for one to be whole.
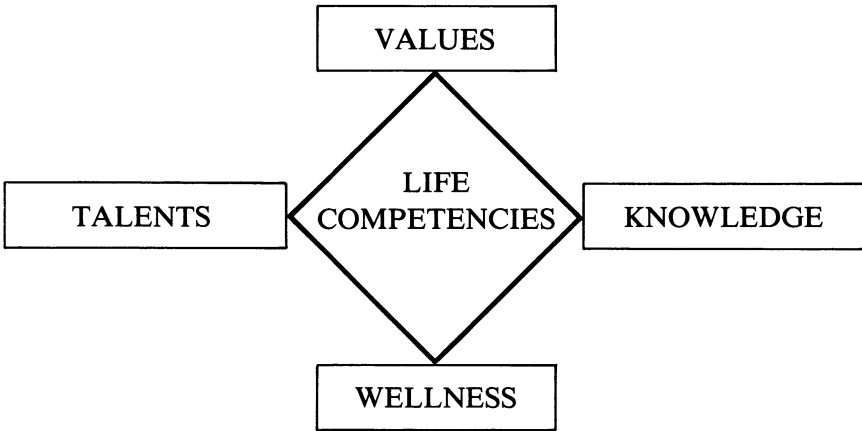
FIGURE 1. LIFE COMPETENCIES MODEL

The knowledge dimension is concerned with the acquisition of information. In addition to the traditional curriculum content, information about how one processes information (metacognition) and mind/body integration which facilitates learning are included in Figure 2.

A great deal of knowledge has been added to the curriculum over the years but very little has been removed, hence the often heard lamentation of teachers: "not another thing for me to try to fit into

an already overcrowded schedule.'' A main point of the knowledge dimension is the determination of the essential knowledge to be learned. It is now time to consider the elimination of some content and find ways which will impart the essential knowledge while developing life competencies. Calvin Taylor (1985, p. 188) says that a teacher can be a talent developer while simultaneously dispensing knowledge to students.

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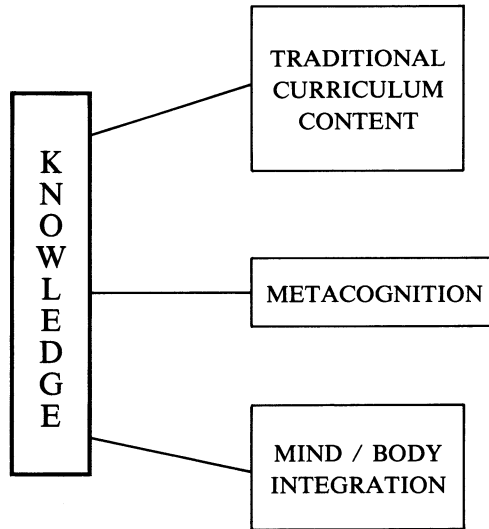
FIGURE 2.

The talents dimension of the Life Competencies Model, as shown in Figure 3, is derived from the work of Calvin Taylor and John Raven. Taylor (1985) refers to these talents as high-tech creative talents that are the basic talents needed in quality performances as well as accomplishments in careers and in lifetime activities.

Raven (1984) defines ''components of competence'' to be the characteristics and abilities which enable people to reach their valued goals. His research has found that while there is a great deal of agreement as to the outcomes of education among various groups such as parents, teachers, administrators, students, and employers, much of what is done in schools is counterproductive to fostering such com-

petencies. In short, everyone agrees that schools should teach students to be self-confident, creative, independent, and self-disciplined, Yet these are not the behaviors that are traditionally rewarded by schools. Regurgitation of knowledge is the behavior most often rewarded.

TAYLOR

Academic
Productive Thinking
Communicating
Decision Making
Forecasting
Planning
Implementing
Human Relations
Discerning Opportunities

RAVEN

Self-confidence
Initiating
Analyzing
Leading
Persisting
Risk Taking
Problem Solving
Goal Setting
Etc., Etc.

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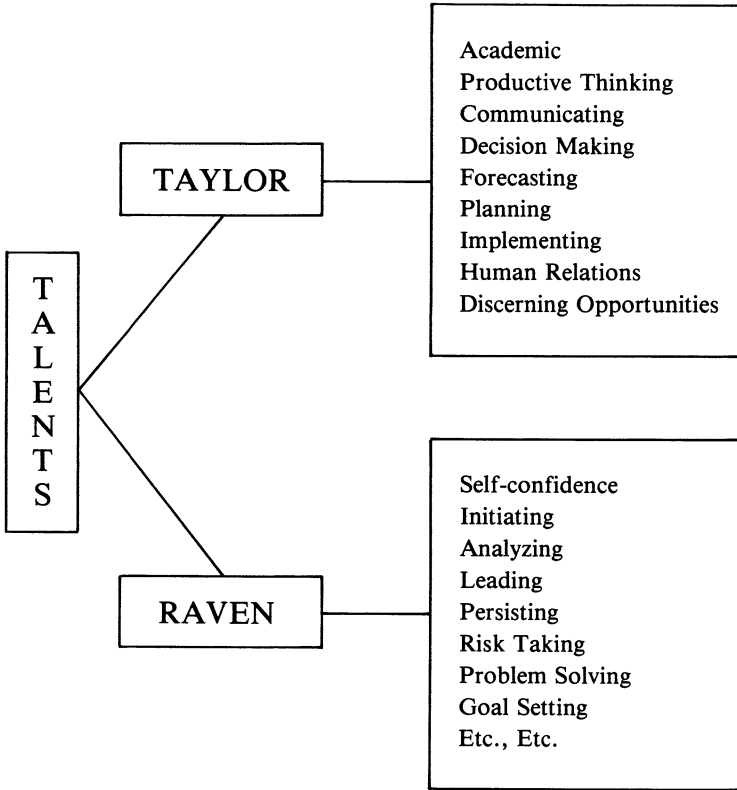
FIGURE 3.

Person's values interact with that person's knowledge, talents, and wellness as he/she moves toward life competencies. The blending of cultural, societal, and personal values creates an individual's belief system. Raven (1984, p.132) states that "the most important components of competence—such as the tendency to analyze, bring to bear past experiences, anticipate obstacles in the future, take initiative, lead, and follow—will only be practiced and developed in pur-

suit of valued goals.'' Figure 4 illustrates some of the components for the values dimension.

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              ┌──────────────────────────┐
              │   SELF-ACTUALIZATION     │
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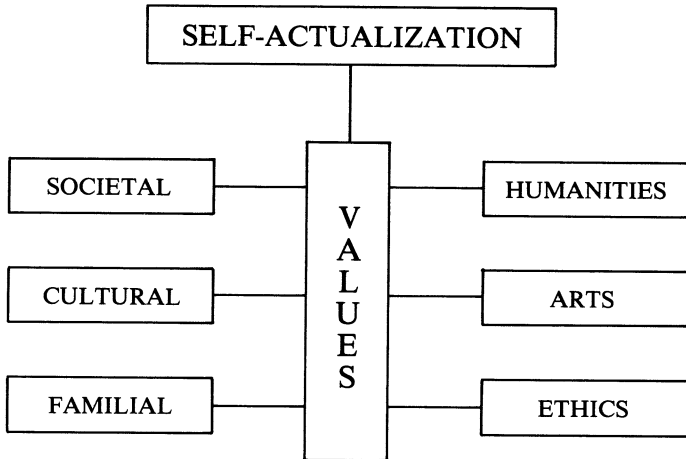
FIGURE 4.

The wellness dimension (Figure 5) can be compared to fuel or energy. It's the gasoline that makes the car run. Like the main model it also has four dynamically interrelated elements. When these elements of physical, emotional, spiritual and intellectual wellness are in balance, energy is at its maximum, readily available to fuel the expression of life competencies. In teaching, our objective is to help others to grow in a wholistic manner. Then we need to be personally and professionally well to model and organize the learning experiences of others.

The proper combination of nutrition and exercise is essential to physical wellness. There are a wide variety of programs for exercise and diet. It is essential that each person find the diet and the exercise regimens that allow for their maximum performance.

The key to emotional wellness is the exercise of control. Factors outside of individuals, frequently not within their control, can produce stress which over time will contribute to illness or imbalance. Stress related illnesses can be avoided with some knowledge of body/mind relationships and with practice of techniques for combating stress responses.
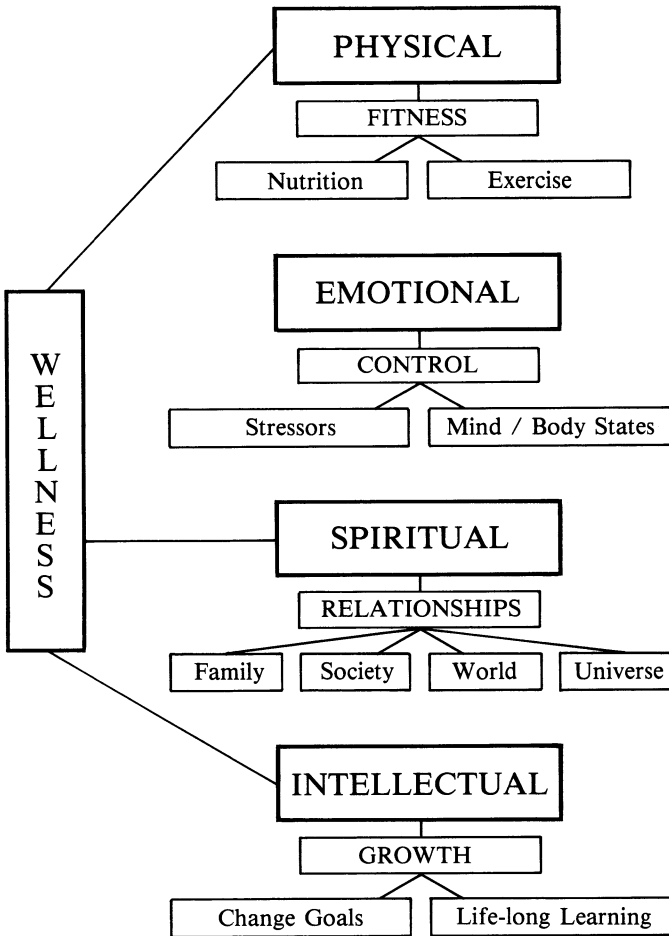
Spiritual wellness consists of ascertaining one's relationship to the whole family, society, world, universe and to one's role or purpose in life. this wellness dimension is grounded in values and is the basis of self-image and beliefs. There are any number of philosophies and religions that one can use in helping to define these relationships.

Intellectual wellness deals with the commitment of the individual to change and grow. It is a recognition that learning is a lifelong process of relating knowledge and talents. Intellectual wellness requires

one to have growth goals and in the case of educators, to have goals that contribute to the growth of others.

Care should be taken not to confuse an absence of disease or an absence of physical ailment with wellness — and certainly not with the highest level of wellness. It should also be noted that an imbalance in other dimensions of the total model can reduce the level of wellness, even to the extent of causing illness or disease.

Past attempts at educational reform might be described as the Band-Aid approach where a need has been identified and another Band-Aid is added on. This model is not intended to be just another Band-Aid. The four dimensions should not be addressed in isolation because they continually interact with each other. An understanding of the interaction among the four dimensions is essential. The goal must be to develop life competencies through creating a balance and harmony among the four dimensions in our personal, professional and student's lives.

Paul Pearsall in his book, *Superimmunity* (1987, p. 221) points out that, "One of the most significant threats to the wellness of our society is the lifestyle led by our children and an educational system that values *being right* over *being*." This model can help ourselves and our students learn to become effectively functioning whole human beings.

Perhaps the difference between gifted people and others is not so much ability but wholeness. Those who are able to create a fluid harmony among the four dimensions are operating with their whole beings and are more likely to reach their full human potentials in comparison with those who are operating with one or more almost flat tires.

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Human Brain-Mind Design:
Toward Pluralism in Education

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The noted neuroscientist Karl Pribram once said, "consciousness is what you pay attention to." No better definition exists. With exquisite economy, Pribram binds consciousness with choice—"paying attention" is the choice, the intentional focusing of the senses on experience. Focusing attention involves both apprehending and comprehending. What this means is that the mind pays attention in two major ways. First by sensing or apprehending, the human mind recognizes the emergence of the act of paying attention. This happens without cognitive understanding and is commonly called a "gut" feeling or an involvement of a "sixth sense." The second and more conventional way of paying attention is through comprehending or understanding. Comprehending results from having new experience that may be understood in relationship to previous experience. Sometimes the experience refers to previous personal knowledge. In other words, apprehending focuses attention but may not "make sense." Comprehension focuses attention and does make sense.

Our human capacities for reason, logic, deduction and the search for meaning are well recognized and honored. For more than eight thousand years the development of these qualities has marked a series of noble steps in the history of Western civilization. These ways of knowing are the foundation for comprehension.

Less understood are the workings of apprehension. When we apprehend something we are immersed in the domain of pre-understanding — our senses are involved in configuring something without personal or cultural reference. Instead of experiencing bonds to reason and logic which characterize comprehension, the apprehending mind is bathed in emotion and tentativeness. There is often a strange mix of excitement and fear — a blend of wanting to continue into the unknown and a reflex to retreat to the safety of that which is already understood. Apprehension is the training ground for both fear and courage in the human mind. Historically we have exaggerated the role of fear.

Clearly, comprehension has been the favored pattern for the tens of centuries of mind work in Western civilization. The creation of a culture requires the stability and fixedness of certainty, i.e., comprehensiveness. This is not true only for Western civilization, but for all the "civilizing" tendencies of all cultures on the planet. What are called customs, folkways and mores, are comprehensions woven into a tapestry of approved rules of conduct for a society. Rules are intended to make sense — thus when a culture establishes rules, it is creating a comprehensive "sense" for itself.

Culture has built into a reflex for "making sense." The end result is that when we experience something new and unexplainable *we often create a logic where none is yet warranted. Or,* as is more frequently the case *we dismiss or denigrate the new experiences that we cannot comprehend. Both are disastrous.* The first leads to premature conclusions, prejudice and superstition. The second results in insensitivity, and a mundane slavishness to the commonplace.

In terms of the human evolutionary journey the capacities for creating comprehensive schemes of understanding are a late gift. Their first occurrence probably accompanied the origins of speech. Speech was followed by notation systems (lunar charts and the recording of patterned movements of the sun and stars) and soon the abstract notation systems of writing emerged. Once tribal groups found ways to code experience into notation systems, many began to emphasize the comprehending expression of thought over the apprehensive origins of thought. In other words the practices of reading, writing and ciphering gained higher status than the apprehending natures of emotion, metaphor and intuition. Logic and science had sprinted ahead of myth and art in intellectual status.

Brain-mind Design

For the past fifty years, there has been a large scale exploration of the form and function of the human brain-mind system. The results of this research are beginning to be translated into the everyday parlance of education and management. In the mid-seventies much of the research related to the different functions performed by the left and right cerebral cortex. The major result of the research was to affirm the complementary ways of processing experience found in each of the cerebral hemispheres. The research findings indicated that the left hemisphere processed experience in accordance with cultural schemes of logic, sequential order and reductive analysis. The right hemisphere exhibited dominant activity when thinking required metaphoric, analogic, visual spatial and proliferative operations.

Educators committed a grave error early on in the popularization of this research when they assumed that certain subjects in school were either "right" or "left" brained in content and that certain students were right or left brained. The error was one of misinterpretation. *The brain lateralizes the way it processes experience; the brain does not lateralize content.* All curriculum is basically whole brained and all students are whole brained, but many subjects may be taught in ways that favor left or right processing. Schools clearly favor left brain processing (logical, sequential, analytical and reductive). In education we can create more wholism and more complete brain-mind function simply by changing the way we currently teach what is already offered in existing curricula. Massive curriculum revision is not the issue, rather the issue is massive revision of teaching methodology.

Another arena of research in the neuroscience that provides insight into the core of the educational process is contained in the triune brain model. The triune model is anatomically a vertical model of the brain whereas the lateralization model is a horizontal model.

The triune brain represents both an evolutionary model and a developmental model. Basically the focus is on the differences between the function of the parts of the brain that formed earliest in the evolutionary development of complex vertebrates and those parts formed latest in evolutionary development. The three basic parts from earliest to latest are: the brain stem, the limbic system, and the cerebral cortex. Researchers often refer to the brain stem as the repti-

lian brain, the limbic system as the neomammalian brain and the cortex as the mammalian brain.

In terms of the evolutionary development the earliest part, the brain stem, governed species survival capacities. These included 1) fighting and territorial defense, 2) fleeing and escape, 3) food, shelter and water access, and 4) reproduction of the species. It is unfortunate that in the history of brain research these functions, because they were so "basic", became seen as being of "lower" status and called by some, "animalistic." In contemporary times each of these so called "animalistic" needs have been elevated to art forms of human involvement. Athletics, dance, gourmet dining, architecture, and physical expressions of love are examples of the more aesthetic expressions of brain stem function.

The limbic system is a complex of eight different parts. When taken together, its functions seem to govern emotions, feelings and tacit forms of knowing. In educational terms, the limbic is the body's organ of the affective domain. Many studies indicate that the right cerebral cortex is also related to the affective domain. Some researchers report a larger physical connection between the limbic system and the right cortex than is found in the connections to the left cortex. It is likely that the limbic system apprehends the context or pattern of experience and depends upon the right cortex to prepare neural information for the left brain to put into conventional languages for reading, writing, ciphering and reasoning.

Much of what educators have traditionally called the affective domain originates in the central nervous system, the brain stem, the limbic system and the right cortex. It is through these components of the brain-mind system that experience and information is prepared for human action. Until recently, this preparation function was largely ignored because it is fundamentally without standard language and vocabulary to describe it. Instead psychological research has dominantly focused on what can be explained through language. Learning theories are powerfully biased toward cognitive functions. The affective, when dealt with at all, is often limited to that which lends itself to verbal expression via cognitive language. When Michael Polanyi said "We know more than we can say," he was describing the yawning chasm between the realities of apprehension and the reporting capabilities of language and cognition. Values clarification techniques have in the past been the most common technology of affec-

tive education in North America. In reality, values clarification is little more than a cognitive processing of a small part of what can be said about the vast non-verbal synthesis of the apprehending mind.

To summarize: More of the human brain-mind system is devoted to the apprehending functions than to comprehending functions. The brain stem creates an affective ecology in which children experience a sense of safety and physical well being. The limbic system attends to emotions, feelings and tacit forms of knowing. The limbic system treats these attributes in two ways: 1) direct experiencing of emotions, feelings and tacit knowing and 2) pre-conscious "understanding" of the role these play in the culture at large. The right cortex builds the base for metaphoric and intuitive knowing. The left hemisphere creates the formal link between the child and the culture at large.

Implications in Education

Early educational theory was formulated as though students were all the same and differed only to the degree that they were "slow" or "quick" to learn that which was being taught. Early curriculum views held that there was basic knowledge and that knowledge constituted the curriculum. The basic skills were those skills that facilitated access to the fundamental knowledge perspective.

When educational management (the implementation of the curriculum) became a dominant concern, attention was focused on the *rate* at which students acquired the basic information. This lead to a methodology that created a slight diversity in instructional approaches leading to acquisition of basic information. It also marked the beginning of a public emphasis on the "basics" of reading, writing and arithmetic. During the sixties and seventies, there was massive federal funding for curricular reform. Most of the designated projects focused on content revision (information). A few, however, emphasized "the scientific method" and thus were attentive to the behaviors exhibited by scientists as they did science.

By emphasizing behavior, education entered into a long confused period where learning became defined only as a change in behavior. Motivation, creativity, emotion/feelings/values and a host of intangible human characteristics were winnowed out of the formulae of education. During the late sixties and early seventies, behaviorism held tightly to the educational scent.

During this same period of time neuroscientists began the process of making public some of the findings of basic research in the brain-

mind system. A few educators began to recognize that information was emerging about the fundamental design of the human brain-mind system that had profound implications in education. This period marked the beginning of an era where the possibilities of human design began to be of more concern than the limiting philosophies of control which historically had held education firm in its grasp.

The richness and diversity of the brain-mind design began to unfold in such a fashion that diversity in function, motivation, affect and even behavior, was seen to be connected to basic biological qualities rather than societal precedent. *Humans were clearly designed to perform in ways far beyond the narrow confines of limited information, limiting skills and limited motivation.* If one looks at schools from a *systems* standpoint, it is clear that the *schools were the institution invented by society to limit the brainpowers and the experiences of the students they served.*

In contemporary times, there are a myriad of approaches found in the schools that honor and nurture diversity. Learning styles, learning modalities, multiple intelligences, thinking skills, reasoning skills, cooperative education, more wholistic approaches to the affective, aesthetic education and a renewed and burgeoning interest in creativity are but a few. The diversity of student capabilities is being nourished by methodologies that insure more effective access to the information base of the curriculum. Moreover, the presence of such diversity in instruction is resulting in the inevitable evolution of traditional information to new and more viable forms. Super-pose upon this the computer and its ability to support the teaching of the basic skills, extend access to information, solve problems, store data, access existing data bases, etc., and the true realization of what Jerome Bruner called ratiocinative amplification—the computer as amplifier of reason—becomes a reality.

What we are witnessing in the framing of educational theory and practice is the emergence of a more balanced model—a model that is based upon both biology and society. This new synthesis of vision blends the attributes of our biological design and the collective organized structures of social living. We are becoming devoted to restructuring social consciousness so as to embrace biological design and we are exhorting biological design to flower into its evolutionary intent.

There has been little doubt of the integrity of a mindset of pluralism in regard to human affairs concerned with gender, age, race,

philosophical ideologies, religious beliefs and global citizenry. What we see rising to support such vision is the extension of such vision to the realm of learning as it applies to each individual. Educational pluralism has imbedded within it the integrity of social pluralism. What better way to serve the diverse agendas of humankind than to honor the diversity of each individual as they learn to learn.

Such a vision of schooling is destined to teach our young to cherish their comprehending *and* apprehending minds, to have them know and guide the various capabilities of their own brain-mind design, to have them learn that differences in capability and preference are strengths. Further they may learn that there is an urgency in re-establishing the grace needed to seek harmony with all human families and the planet upon which we live. We are exploring how to develop global minds for the global village that has become our home.

Developing the Talents
and Competencies of
All Our Children

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In this article I will show that there is a need 1) for radical change in education, 2) to identify the competencies which the educational system needs to foster, 3) to describe the way in which some teachers foster these competencies, and 4) to discuss all of the barriers to wider dissemination of this work and their implications for research and practice. I mean *career and life competencies*, not just competencies required and developed in traditional knowledge-focused schooling. For example, career and life competencies are illustrated by the great number of action verbs printed on the cover of our latest book, *Opening the Primary Classroom* (Raven et al., 1985).

There is a Real Problem in Education

If anyone needs evidence that there is something wrong with schools — and particularly secondary schools — they will find it in Goodlad's (1983) vast study of 8624 American parents, 1350 teachers, 17,163 students, and 1000 classrooms, published: "A Place Called School." Students spend most of their time in boring, non-cumulative routine activities — largely being talked at in classes on

language, spelling and arithmetic. Drill and practice predominate. The "academic" and "intellectual" studies undertaken barely deserve the name: they rarely involve analysis, evaluation, hypothesizing, interpretation, judgement, reconciling different points of view and conceptualizing problems, let alone the identification and understanding of any problems. There is little inquiry-oriented activity, still less sensitive, respectful tradition of the development of students particular talents. There is little opportunity for students to practice doing such things as thinking, planning, inventing, communicating, re-assuring, leading, working with others, or developing their own understanding of how society works and taking the initiative to influence it. They were therefore unable to experience the satisfactions which come from doing these and developing the motivation to do them, or the abilities required to do them successfully. This is serious because most parents, teachers, pupils and employers think that the main goals of education are fostering competence in these areas. Surveys and other research show that these opinions are correct.

Goodlad's work shows that students attach little importance to the content of their studies. They focus on grades. They are goaded to work instead of being encouraged to develop self-direction and self-discipline. Students get little help with their problems. Goodlad comments: "We would not put up for long with a physician who sent our child home with an 'F' for health, but no assistance in becoming healthy."

Only English and mathematics are considered important by more than two-thirds of high school students — and that for the future, not the present. Unfortunately in two years, students will forget 80% of what they have been taught so even their hope that their studies will one day be of value to them is ill-founded. School subjects are boring: only Arts, P.E. and languages are rated as interesting by more than one-third of those taking them. Little is done to capitalize on potential sources of motivation - to, for example, encourage students to develop communication skills by first ensuring that they want to communicate, and are therefore in a frame of mind to seek feedback.

Traditional frontal teaching predominates. No real attempt is made to cater for the wide variety of talents and abilities which are present in every classroom. Little attempt is made to vary teaching

methods and content so as to engage the attention of all of the students for at least some of the time.

These results confirm, in virtually every detail, the results of studies which my colleagues and I have carried out in the UK over the past 20 years and which have been replicated by others in Belgium, Ireland. To reinforce Goodlad's conclusions, it may be mentioned that more than half of the adolescents we interviewed said that more than half of their subjects were both boring and useless. They wanted schools to do more to achieve more than 90% of the objectives we asked them about. Bill et al. (1974) found that 98% said they were failures at school. Bachman et al. (1978) found that 83% of young adults said that they had been better able to identify and develop their talents at work in comparison with school. (Editor's note; The Salt Lake Tribune highlighted this point in his conference speech by their article titled: *Scot Says That Factories Develop Talents More Than Schools Do.*) Most of the employed adults we interviewed said that they had not learned things at school which were useful in their jobs or in their leisure (Raven, 1977). Compared with their bleak experience at school, however, more than 80% liked their jobs, liked their employers, and found their jobs interesting.

These results add up to the conclusion that some two thirds of the money spent on secondary education is wasted so far as the development of the talents and competencies of young people is concerned. *For pupils, schools are the worst working environments in our society. They are also the least developmental.*

There is a Real Need for Radical Change

There is a need for radical changes in education. There is an urgent need to re-deploy the resources devoted to education and there is need for creativity, invention, and the exercise of political and administrative responsibility.

The results show, that it is in the social sphere—and not in the production of widgets—that creativity and invention is required if modern society is to function effectively. Although a great deal of attention has been paid to the Japanese ability to produce high quality widgets, it is in the social sphere that they have made their most important inventions. These have included: new forms of work organization, the use of information technology to travel world-wide for,

and to collate technical information, new structures to explore and draw out the possible implications of technical information, and new forms of national decision taking and consensus-building involving what is best thought of as a participative rather than a representative form of democracy.

What Country is the Nation Which is Really at Risk?

Two further conclusions may now be drawn. The *first* is that *we need to change* the way our educational system operates so as to foster such things as a commitment to act in the public interest, the competencies required to influence the way society works, and creativity and inventiveness in relation to social institutions. The *second* is that *we need to change* the procedures we use to select those to whom we offer senior positions in society so that we get people who possess such concerns and competencies into those positions. These changes are so different from those identified in *A Nation at Risk*.

But Goodlad did not come to these conclusions of the need for radical changes. Instead, his claim is that there is no "demand" for educational programs directed toward different goals. From all we have learned, Goodlad's conclusions *cannot be accepted*.

Goodlad's book, which was produced by one of the most highly esteemed and best funded researchers in the world—and which has been awarded the highest accolade available to the American Educational Research Association lacks critical thinking, analytic thinking, intellectual rigor, and creativity. These are qualities which should be fostered by the educational system and which we should require of people who are promoted into influential positions in society. If this is the best that the best known thinkers, researchers and writers in the land can offer by way of research and recommendations for improving education, *i.e., for improving what must be one of the most expensive and dysfunctional enterprises ever undertaken by mankind, then the United States is A Nation Really at Risk* (Raven, 1986) —and the rest of the world with it. What we need is, *not* better means of selecting students who will do well within our present educational system. Instead, we do need *changes* in the objectives and procedures of education programmers, *changes* in the criteria and procedures we use to select and promote people in our institutions and society, *and better mechanisms for releasing energy, creativity and initiative in our schools, workplaces and communities.*

THE COMPETENCIES TO BE FOSTERED

Multiple Talents and Competencies

The second part of this article deals with the competencies which need to be fostered by the educational system. We have seen that most parents, teachers, pupils and employers stress the importance of fostering qualities like initiative, the ability to communicate, the ability to make one's own observations, and the ability to understand and influence the way society works. Is this just window dressing, or are these really the qualities required at work and in society? I have published a summary of the available studies of the competencies required in my Competence in Modern Society: Its Identification, Development and Release (Raven, 1984) and will summarize the material very briefly here.

The Qualities Required at Work

Klemp, Munger and Spencer (1977) and Raven and Dolphin (1978) have shown in Table 1 that more effective managers are distinguished from less effective peers by their greater tendency to think about and develop the talents of their subordinates, move their subordinates into positions where they can capitalize on their talents and have their contributions recognized, listen to what lies behind what people say and do something about it, reflect on the workings of their organizations and intervene effectively in them, analyze the workings of the wider social system among their organizations and orchestrate effective inter-organization activity to gain control over wider social forces. Our work also shows that the willingness and the ability to do these things is a rare quality among British managers, but is much more widespread in Singapore and Japan (Graham, Raven & Smith, 1987).

Table 1
Competencies of More Effective Managers

- Takes initiative: initiates new activities, communications, proposals; exhibits resourcefulness, persistence in the face of obstacles.
- Sets goals and reconsiders and redefines them.

- Coaches: by setting example and sharing information, feelings, and thought processes.
- Influences: by persuasion, mustering arguments, building political coalitions, making others feel strong.
- Conceptualizes, analyses, and finds new ways of thinking about things.
- Builds teams, acts to promote co-operation and team work.
- Provides feedback to enable others to monitor their own performance. Helps them analyse problems and develop strategies for tackling them.
- Provides rewards and official recognition for contributions.
- Controls impulses, especially annoyance. Avoids snap decisions based on incomplete evidence.
- Plans and organizes, including "domain Planning." Delegates.
- Optimists: analyses the capacity of individuals and resources and requirements of a job, matches the two and fully utilizes the resources available.
- Monitors own behavior and that of others.
- Resolves conflicts.
- Listens actively and initiates opportunities to give others a chance to talk.
- Has accurate empathy; makes explicit unexpressed thoughts and feelings of others.
- Helps.
- Has positive expectations of others' competence.

Managerial competence is by no means the only area of competence which has been analyzed. Research has been carried out among navies, small businessmen, civil servants, scientists, and politicians. We (Morton, Williams et al, 1968) found that what 20 year olds, who were "drop-outs" from school at 15 years of age, liked about their job was the variety, the opportunity to take initiative, *the opportunity to make the most of themselves, and the opportunity to develop and use their talents in ways not possible at school.* They did not do the same thing all the time and do things they could not do. It emerges that work —even for this early leaving group —is anything but the soul destroying activity which many teachers take it to be.

Table 2 shows some of the qualities which have been found to distinguish more from less effective school teachers (Huff et al., 1982, Klemp et al., 1980, Schneider et al., 1981, Raven, Johnson & Varley,

1985). Taken as a whole, these data convincingly demonstrate that most parents, teachers, pupils and employers are correct when they say that the educational system should be primarily concerned with fostering such qualities as initiative, the ability to make one's own observations and to identify and solve problems, the ability to work with others, leadership, and critical thinking.

<div align="center">

Table 2
Competencies Distinguishing between
More and Less Effective School Teachers.

</div>

- The ability to work with parents to establish community support networks which allow parents to create developmental environments for their children.
- The capacity to convince community members of the desirability of individualized, competence-oriented educational programmes of growth in schools.
- The willingness and the ability to analyse the role which sociological forces play in determining what happens in schools, and the ability to harness these sociological forces to push them in the direction in which they wish to go.
- The ability to handle the political problems which arise when pupils are encouraged to develop the capacities required to tackle pressing social problems such as pollution.
- The ability to identify the talents of all their pupils and to create group and individual educational processes which enable all children to develop their unique patterns of competence.
- The ability to evolve, in co-operation with other teachers, their own understanding of how growth is to be promoted and how to gain control over the wider constraints on education—instead of waiting for authority to tell them what to do.

Civic Competence

But these managerial and teaching competencies are not the most important insights to be fostered by the educational system which have emerged in the course of our work.

Some 20 years ago, I got an opportunity to study "values attitudes and institutional structures associated with economic and social development" in the Republic of Ireland with concepts such as need

achievement, leadership and creativity at the forefront of my mind. I talked to people in a range of jobs and asked them about their qualities and to tell me about their jobs and their lives. When they got excited about some problem they had, I asked them what they could do about it.

One after another said "There's nothing I can do about it: the Government must do it." I thought "Good gracious, what's happened to all our initiative, leadership and ability to persuade others to help us do something about our problems?" Teachers, through chief organizations, have a crucial professional role to play in pressing for such work.

Summary

In the course of this article it has been shown that:
- Schools are currently stultifying environments which fail to foster most of the competencies of most of our children. In fact, schools exist, not mainly to educate, but, to legitimize the rationing of privilege—the phrase of Jencks et al. (1973).
- Given the overwhelming evidence that there is something very seriously wrong with schools, and particularly secondary schools, the inability of the esteemed researchers and academicians in the land to recognize the seriousness of the situation and make realistic but radical proposals for what should be done is disturbing.
- In fact it is worse than that: on the one hand there is a lack of creativity, critical thinking and analytic research competence—all qualities which the educational system should be concerned with fostering—among those who have been selected into the most influential positions in the educational world and awarded the largest research budgets and highest accolades. On the other hand, there is the problem that the structures and processes for funding research have faciliated neither the fundamental research for which any serious attempt to tackle applied problems reveals a need, nor the development activities which are required to translate research into practice.
- These observations suggest that the *United States really is a nation at risk and the rest of the world with it—but not for the reasons given in A Nation at Risk*. The real need is to foster qualities like creativity and leadership (Taylor, 1986), inven-

tiveness and intervention are needed most urgently in the social—and not "technical"—domain. This is where the Japanese have really scored. It is their social inventions which have enabled them to debate the kind of society they want to create in the future—and to set about creating it. And it is their social innovations which have enabled them to build up an understanding of how every political economy known to mankind works and invent a way of penetrating it to their own advantage.

- There is ample evidence that at work, as citizens, and in "leisure" there is need for people at all levels of society to possess competencies such as initiative, leadership, creativity, the ability to make their own observations and identify and tackle the problems identified in the course of making those observations, and the ability to understand and influence what happens in society.

- These qualities are not highly correlated with each other and have little in common with "academic ability" as operationally defined in schools.

- Such qualities can be fostered in homes, schools and workplaces. They are not inborn. However, they cannot be understood in the way in which psychologists have tried to conceptualize "abilities." They are value-laden, psychologically complex, qualities—not value-free, unitary, qualities.

- Important features of the educational processes adopted by teachers who foster these qualities effectively include:

  - changing from a concept of teaching as "telling" to concept of teaching as "facilitating growth."

  - changing from a focus on conveying a knowledge of common and out-of-date subject matter (content) to fostering competence.

  - focusing on activities to be encouraged rather than knowledge to be conveyed.

  - thinking in terms of "abilities" and the "areas of giftedness of each child" instead of in terms of "ability" and "gifted children."

  - creating developmental environments in which each pupil practices and develops a number of competencies in the course of undertaking demanding activities which he or she cares about.

—   modelling—in person and through the use of litera-
        ture—the cognitive, affective and conative components of
        competence in such a way that pupils can emulate them.
—   working with parents, directors of education, heads of
        other schools, and others outside schools to influence the
        expectations of parents, those who control the flow of
        pupils into other "educational" institutions, and the tests
        to assess pupils' competence. It is what teachers do out-
        side their classrooms to influence these wider social forces
        which primarily determines what they can do inside them,
        and by taking steps to get control over these social and
        political forces, teachers exemplify one of the more sur-
        prising conclusions of our research: it is people's ability to
        influence the wider social constraints on what they can do
        in their jobs which primarily determines their competence.
        Thus civic competence and leadership become some of the
        most important competencies for teachers to foster in
        pupils. By portraying such behavior themselves, teachers
        communicate an important message to pupils.

• If generic-competency-oriented education is to be more widely
  disseminated, the following are necessary:
—   tools which will help teachers to manage multiple, indivi-
        dualized, competency-oriented programs of growth.
—   tests which will enable pupils to get credit for possessing
        such qualities and teachers for fostering them.
—   activities to resolve the dilemmas inherent in educational
        programs which promote diversity instead of equality.
—   changed expectations of public servants (including teach-
        ers). They, for example, need to be expected to do, and
        to be held accountable for doing, such things as paying
        attention to, and inventing better ways of meeting, clients'
        needs.
• All of the above imply changes in the perceived role of applied
  social researchers. They, too, need to be expected to be adven-
  turers and inventors, not mere hired hands whose job it is to
  collect the "facts needed by administrators."
• It is worth emphasizing that our work provides no support for
  the most commonly advocated "solutions" to the "problems"
  of the educational system—testing children on the 3Rs, testing
  teachers' competence at the 3Rs, and improving teachers' op-

portunities for promotion. There are nine good reasons why schools rarely pursue the educational objectives which most parents, pupils, teachers and employers believe to be the most important — and teacher laziness and incompetence are not among them.

If there is a single note on which I would like to conclude it is, above all, that the pursuit of multiple-competence-oriented educational programs is anything but a wish-washy, do-as-you-please, mess. *It is a demanding, structured, process, directed toward different — and much more important — goals than those embraced by most schools at the present time.* It has embedded within it a paradigm shift relating to concepts of ability and competence and their development, recognition, and use in society. It has implications for the way we organize society. *But without all these things — the creativity, leadership, initiative, commitment to society and commitment to developing and harnessing all the talents available to mankind,* which generic-competency-oriented education sets out to foster — *we are, indeed, Nations at Risk, even a Whole World at Risk.*

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Editorial Note: This article (and its lengthy set of references) has been shortened considerably by the editor. A longer version and set of references by Raven (1987) was published earlier in the journal of the World Council for Gifted and Talented Children, namely, *Gifted International* Vol. V, No. 1, 8-40, 1988. The reader can also refer to the article *A Nation Really at Risk* (Raven, 1986 cited herein). The full version of his 7th World Conference speech in a 23 paged single-spaced form including eighty-nine number of references and a Model of Competence Grid can be obtained from John Raven, whose address is on the first page of this article; or from Calvin W. Taylor, Bldg. 505, University of Utah, Salt Lake City, Utah 84112.

Final Plenary on First Six World Conferences and On Future Perspectives in Four World Regions

Final Plenary Session at
the 7th World Conference

Before the conference, two superb consultants of our long range Utah creativity program are singled out with brief samples of their messages which we share with our readers here and with others elsewhere at almost every opportunity. These are brief replacements for other final plenary panel presentations which were not written up (and not captured on tape).

The first earlier consultant was *Luis Alberto Machado of Venezuela*. He was the first in history in a President's Cabinet to serve as a Minister for the Development of (Total) Intelligence (Total Brainpower). The essence of two of his remarkable statements are:

(1) The most important human right is the right to the full development of the total potential powers of the brain in each person—as far as is scientifically possible. Every nation has the obligation, even the duty, to implement ways to activate and develop everyone's full brainpower *and thereby fulfill this human right* in every person in their country.

(2) Venezuela has something worth far more than its "black gold" (oil), namely its "gray gold" (the brain's gray matter) which determines everyone's potential creative thinking talents.

Likewise, he says that in his country *the greatest potential energy resource* is its "gray gold," not its "black gold."

Editors Notes: As implied by Machado, this all-important human right is really a birthright of every person born on Earth. Nowadays, some systems may be saying that they are going to empower all their children and make them accountable for being so empowered. Unknowingly, such systems are implicitly admitting their past guilt of already having disempowered the brain potentials of their children, and thereby have taken away what Machado indicates is an all important birthright in all of them. These systems have also been very faulty by *not* being the accountable ones but instead by putting the accountability on their children whom they are empowering . . . somewhat.

The second consultant was Arnold Toynbee, the eminent British historian, who is mentioned in the description of our theme. He has excelled in foretelling history as well as writing volumes about past history. At Taylor's 1967 Summer Creativity Workshop, in his speech "On the Role of Creativity in History," *he called creative talents the history-making talents in any area of human endeavor.* Through earlier correspondence, he had already given us permission to reprint his U.S. Alumni magazines article "Is America Neglecting Her Creative Talents" and thus her future history-making? In that article he emphasizes that *creativity is mankind's ultimate capital asset — a matter of life and death for any society.*

He also said that America has had three great periods of creative leadership. These were: (1) leaving the old world and crossing the ocean to settle on our Atlantic seaboard; (2) getting out from under foreign rule by revolting successfully and forming a new government; and (3) by challenging with courage and daring, the western frontiers and thereby pioneering and winning the west.

His vision of America's manifest destiny is for her to have another (4th) major burst of creative leadership, of American pioneering. He wrote that if America is to fulfill her manifest destiny, she must treasure and foster all the creative potentials that she has within her. And through it all, she is to spark greater creativity all round the globe to help the indigent majority of mankind to struggle upwards toward a better life than it has ever dreamed of in the past.

COMMENTARY ON THE FIRST (1975)
WORLD CONFERENCE IN LONDON:
GIFTED CHILDREN—LOOKING TO THEIR FUTURE

Thomas Marjoram, Co-Chairman

Many of you remember Henry Collis, a distinguished educator, former President and founder of the World Council. He phoned me before I left for Salt Lake City and asked me to convey to you his affection and best wishes for the continued success and growth of this major world organization.

Fifteen years ago, in 1973 when I had just taken over national HMI responsibility for gifted children in England and Henry was Director of the NAGC, we set up our first national conference. So successful was this that Henry was encouraged to set up the first World Conference in London in September 1975. I organized DES support and the Ministerial Reception. Thus was our organization launched. Henry of course attended all the subsequent World Conferences up to and including Hamburg.

As I look round this splendid gathering tonight, I see many faithfuls who may remember those early days better than I. From UK we had Sir George Porter FRS, Lord James of Rushholme, Miss Sheila Browne, head of HM Inspectorate, Dr. Eric Ogilvie and several of my fellow countrymen here today.

As keynote speakers and contributors from the rest of the world we welcomed our present President Harry Passow, James Gallagher, Iraj Broomand, Warren Lett, GW Parkyn, Dorothy Sisk, Nava Butler, Erika Landau, Jean-Charles Terrassier and many others who are still here. Altogether we had 500 people from over 50 countries.

The theme of the 1977 Second Conference on "Reaching Their Potential" looks to their future and sums up Henry's life work of striving to encourage and develop the talents of young people. He would have been wholeheartedly behind the theme of this 1987 Seventh Conference in its bid to make the world more aware of creative potentials of all kinds and of its responsibility to cherish and nurture the great benefits to mankind that can flow from realizing them.

In my view, and in Henry's too, we are only at the beginning of our great task. There is still widespread wastage of human talent not only among poor, starving children, but in ordinary relatively af-

fluent classrooms where many able children still freewheel and lan-
guish and even sometimes encounter resentment.

In the coming years let us work even harder to broaden our at-
tack, involve more actively all delegates, forge stronger links with
other professional organizations, improve our publicity and political
impact, and above all disseminate widely our educational beliefs and
research conclusions.

There is much to be done. Let us enjoy this evening but tomorrow
roll up our sleeves again.

COMMENTARY ON THE SECOND (1977)
WORLD CONFERENCE IN SAN FRANCISCO

Robert Swain, Chairman

First, the California Association for Gifted (CAG) sent me as its
President to London in 1975 to the 1st World Conference on Gifted,
which was chaired by Henry Collis. I was instructed by CAG and I
was prepared to offer California to be the site for the 2nd World
Conference. CAG was willing to support financially the conference.
Subsequently, I was appointed the person to chair the 2nd Confer-
ence.

Second, Hal Lyon, in the then-called *U.S. Office of Education*
(USOE) as the Director of Gifted, called a meeting in Washington
and CAG sent me to make the 2nd pitch for California to be the site
for the 1977 Conference. I must say that Washington politics were
amazing and somewhat amusing; however, having been schooled in
kooky California, I was ready and my pitch was successful. USOE
appointed Jean Dorsett Robinson, George Washington University
Fellow, and assigned her to work with us on the 2nd World Confer-
ence.

The 2nd Conference was held in San Francisco, California from
July 27 - August 2, 1977. About 850 registered, representing the fol-
lowing nations: Australia, Belgium, Brazil, Bulgaria, Canada, Den-
mark, England, France, Greece, Iran, Ireland, Israel, Mexico, Neth-
erlands, Nigeria, Panama, Saudi Arabia, South Africa, Sweden,
Taiwan, Uruguay, U.S.A., Venezuela, and West Germany.

Martin Harris was the effective Assistant Conference Coordina-

tor. He is still active in Education of Gifted, is a Professor at U.C. at Davis, a Private Consultant, an Education Evaluator, and author of Computer texts.

During the program at the 2nd World Conference, Paul Plowman was the steady, hardworking, innovator and plugger, around whom the worker bees swarmed and were directed to success. His 2nd (1977) conference presentation, "Futurist Views of Gifted Child Education: Images of What Might Be" (p. 405), holds merit eleven years later. His presentation at the 7th World Conference in Utah in 1987 on the "Rise and Demise of Gifted Programs in California" keeps an accurate tally of what has been happening historically and also of the sad direction that the future is taking.

At the business meeting on Tuesday, August 2, the last day of the 2nd World Conference, representatives of the nations in attendance met to set into motion the actions necessary to establish officially the World Council for Gifted and Talented Children. Iraj Broomand was elected President.

Jim Gallagher edited the 2nd Conference Proceedings titled *Gifted Children Reaching Their Potential* (1979), which were then printed in Israel. Every 1977 attender was to have received a copy mailed from Israel.

Robin and I, as you know, have ventured and created a second career in South Lake Tahoe, California. Our "Swain's Bed & Breakfast" has become successful. Many of the folks who attended the '77 Conference come periodically now to visit us and stay to enjoy the beauties of the Sierra Madres.

COMMENTARY ON THE THIRD (1979) WORLD CONFERENCE IN JERUSALEM: GIFTEDNESS IN ISRAEL

Erika Landau
Tel-Aviv University, Tel-Aviv, Israel

The Third World Conference on Gifted Children of the World Council for Gifted and Talented Children was held in 1979 in Jerusalem on the topic: Challenging Their Potentials; New Perspectives and Alternatives.

Dan Bitan, the Chairperson wrote in the preface of the Proceedings of this convention (which was edited by Alan H. Kramer) that in spite of the high attendance and more than 100 successful lectures and workshops, only 23 countries had registrants and less than 10 countries could present, on a large and meaningful scale, programs existing for gifted children.

Today, here, in Salt Lake City, seeing the crowd from all over the world, we should all be proud of the achievement in spreading the importance, urgency and necessity to discover, foster and develop gifted children.

Our Jewish culture has a long-standing commitment to the encouragement of learning and the challenge to excellence. Children as early as four years old learned, in small groups, to read the Bible. Later on they learned the various interpretations of the Bible by different Rabbis. So from earliest childhood their intellect was challenged as well as their creativity by the different approaches. The concern for the creation of an environment which facilitates learning and actualization of potentials became not only philosophical goals but operational principles of modern Israeli society and its educational system.

Very soon, after establishing a standardized national curriculum with very intensive high school matriculation, the understanding came up that the needy of the handicapped, the culturally and ethnically different and those of severely limited intellectual ability, have to be considered in a different way. To meet these needs, an array of supplementary services and provisions have been created specifically to serve these sub-populations. What has been slower in coming is the recognition that such an integrative environment is equally inadequate to the needs of the gifted.

We are a small nation and our human potential is our greatest natural resource. Thus, the talents of every Israeli child must be viewed as an investment in the nation's future, to be nurtured and cultivated to the greatest extent possible. Only by a detailed evaluation of the needs and potentialities of each gifted child—both the achieving and underachieving, the culturally advantaged and disadvantaged, the healthy and the handicapped—can programming be developed to make the most of this essential resource.

Only in the last three decades the view upon giftedness has changed, from the inborn, immutable giftedness that will actualize itself under any circumstances, to the facts that environment is im-

portant in order to challenge the inborn cognitive and creative potentials as well as the drive and persistance of the gifted child.

Thus, the emphasis has shifted from the concept of "genotypic" to "phenotypic" giftedness — in which the environment has a share in its development. The emphasis shifted also from *noting* to the systematic *nurturing* of potential.

These changing perspectives on human potentials provided a wider basis for the servicing of all those children with extraordinary potential of one form or another, those who are already demonstrating high levels of academic success as well as those who are achieving far below their levels of ability, those who come from privileged environments as well as those whose socio-economic base tends to retard the fulfillment of their potentials. In other words, we try in Israel to foster not only manifested but to uncover, stimulate and develop latent giftedness.

We define giftedness: any child who demonstrates an extraordinary talent or ability (or the *potential* to realize that talent or ability) in any specific intellectual, artistic or social pursuit. This giftedness may appear in one or more areas.

It must be remembered, however, that giftedness is a relative concept and relates to a certain frame of reference, and not to international nor to national or regional norms. This means that an outstanding intelligent child in a culturally deprived surrounding needs special servicing for his needs although he or she is not "outstanding" in a more privileged environment. This issue will be elaborated in our following discussion on gifted disadvantaged.

Cultural Disadvantaged. The concept of "cultural disadvantaged" is a combination of family size, low education of parents, and low income. Even the brightest children of this group can not compete with their middle-class counterparts in formal intelligence tests, because of their limited cultural background.

As early as 1963 — only 15 years after the establishment of the state — special boarding high schools had begun to prepare programs for gifted disadvantaged with the goal to close the existing educational gaps. However, taking the gifted children away from their neighborhoods alienated them from their roots, on the one hand and on the other, education in general schools had to be adapted to the lower level of the remaining students.

In the early 70's, enrichment programs were initiated *in* those neighborhoods. The percentage of children who demanded the ser-

vices for the gifted depended on the priorities given to the problem by the parents, who were not so involved in a better educational level for their children, because of their own lower cultural background.

The success of a program depended on how much we could convey and convince by pointing out the social and psychological importance of encouraging the potentials of those children to their parents and their involvement in our programs, as well as to convey the feeling of trust in the continuity of the existing program and resources.

Out of this insight we created several models of working with the gifted disadvantaged:

1. enrichment programs in the neighborhood, if interest, resources, and facilities exist. This gives the inhabitants the feeling of pride that such privileges are given in their neighborhood.
2. to take the gifted out of the neighborhood and bring them once a week to an academic center immediately after school hours. We try to involve several teachers in this project so they learn how to run such enrichment programs. After a year they do it on their own in their neighborhood.
3. to enroll them in existing programs outside their neighborhood where the choice of subjects is wider and the children enjoy seeing new and different neighborhoods.

We have another model which is not an alternative but an addition to other programs: summer camps, where students learn and create either in their community or outside. There were some very good results in cleaning and beautifying neighborhoods during summer camps, as secondary gains to acquiring knowledge and enjoying creating.

The general goal of these courses is to create in the participants the enjoyment of the process of learning and development of involvement in social values.

From our experience we learned that in teaching the gifted disadvantaged we need to put in an intermediary phase. This means not changing our goals or creative way of teaching, but giving more time for reactions to making the already existing knowledge more conscious at the first stage in order to convey a feeling of security and freedom, all of which strengthens the ego of the child. Only then will the gifted disadvantaged dare to "get out into" creative ways of thinking which by their nature includes some unknown and therefore provoking elements.

We see a very special goal in the prophylactic aspect for mental health: challenging the children who might be potential absorbers of destructive influences from their environment, to use their intelligence for constructive social and individual goals.

Programs for the Gifted in Israel. In the late 60's enrichment programs started to work with gifted children. The initiators invited the Israeli Ministry of Education to consider attitudes and policies toward gifted children.

In 1972 a coordinating department within the Ministry started its activities in fostering giftedness. At the first stage enrichment centers, additional frames to normal schools were supported and developed.

In 1973/74 the Ministry opened special classes for gifted children within normal schools.

In the early 80's other regional projects started: one day a week during regular school hours, the gifted children from the schools of a certain region are provided with enrichment experiences in different fields of sciences and arts.

We, at the Institute for the Promotion of Art and Science, at the Tel-Aviv University, Technical College, from our experience of twenty years of enrichment with 5 to 15 years old gifted, work in the last decade on a more general wholistic basis. The priority is on a balanced approach to learning. Early specialization is discouraged as it is felt that such students will ultimately tend to become specialists in their fields. We want to provide them with the broad core of experience, develop their creative attitude in order to give them the tools for their later acquisition of specialized knowledge.

This approach is generally successful through the 5th grade, when our students begin to demand opportunities for more specialized knowledge and experience. We try to satisfy their demands for exact- and life-sciences. However, we offer them also courses which broaden their vistas to new ideas, approaches to learning and independent thinking, with the growing emphasis on creative, affective, and social development. This is our high priority, to produce not just gifted adults, but gifted, creative and involved citizens — individuals committed not only to personal achievement but to moral values and the advancement of their society.

There are many individualized ways of working with the Gifted and they cannot be classified under a certain program. Some skip classes and finish high school two or three years earlier, others attend

regular University courses parallel with regular high-school and finish their BA within a year afterwards. In both cases, we try to bring two or three students together in order not to make them go the way all alone — in other words, to avoid "the loneliness of the long-distance runner."

Leadership Toward the Future. I was asked to speak here about my point of view of our way towards the future of fostering giftedness. I can see clearly what should be our priority in Israel and I believe that it should be the priority of any frame for gifted children: we need leaders — creative, involved, and gifted leaders in all fields of life, all over the world.

We must challenge the gifted children today with our social problems, give them the tools through knowledge in science and technology and emotional involvement, in order to help them to solve our problems as gifted adults in the future.

In our courses such as cancer research, medical biology, problems and conflicts in our society, we present the problems and the knowledge about them as to this day; in courses in logics, decision making, creative thinking, science fiction, drama, psychology, humor, we convey ways and means of thinking, imagining, acting and experiencing; in courses such as leadership, political thinking, art of persuasion, we strengthen their faith that they *can* become a leader and having been involved in our problems, they'll *want* to be a leader.

From our follow-up research on our gifted students of 16 years ago we could see that they are involved today, but formal frames in the past had not strengthened the faith in their abilities to be a leader. When asked what they would like for their own gifted children their answers demanded more social involvement rather than specific scientific knowledge. Most of our subjects, working in sciences and electronics, when asked what they would choose to do now, as adults, if they didn't have to consider anything, answered that they would do something else than what they were doing today. This desire went in two directions: escapism and responsibility. Those who would like "to travel around the world, learn different ways of life," "devote their lives to music," "create their own environment differently," "be on the sea," "use modern electronics and technology for their own needs;" others wanted "to build a research farm to find better and healthier ways of living," "to study medicine and psychology in order to find the integration between body and soul. Only shall we find the real meaning of life and only this will foster the de-

velopment of medicine." "To be a kindergarten teacher and develop ways of teaching children from the earliest age how to cope with our modern world. This is the age when one should start with emotional, intellectual and social development."

I would like to end with the aims we formed and created, during our 20 years of work with gifted children:

TO DISCOVER giftedness in all social levels of our population.

TO UNDERSTAND giftedness and its manifestation.

TO HELP the gifted to discover and develop his potentials.

TO SATISFY the gifted child's need to know, to create, to belong and to be accepted.

TO STIMULATE his intellect and creativity according to his potentials.

TO INVOLVE the gifted in the present problems of our society.

TO STRENGTHEN the gifted personality to act and be a leader.

TO PREPARE the child towards his future as a creative and gifted adult.

COMMENTARY ON THE FOURTH (1981) WORLD CONFERENCE IN MONTREAL

Bruce Shore, Chairman

The organizers of the Fourth World Conference in August 1981 established some special goals for the meeting. First, we wanted to create several bridges, based on the observation that thinking about and research on giftedness were unnecessarily narrow in scope. The first of these bridges was expressed in the theme, "Many views of the gifted for the advantage of all children." We did not subscribe to the simplistic idea that everything one does for or with the gifted (a term we used generally, not to the exclusion of other useful descriptors), could or should be done with all children.

On one hand, some of what we propose and do is just good education. On the other, some is suitably differentiated. Even the latter, however, can spin off into educational benefits for other children, for example, through the creative atmosphere that a good program can foster in an entire school, the spread of pride in accomplishment, and respect for individual differences.

Other bridges were more subtle: 1981 was the United Nations' Year of the Disabled, whose emblem appears in the Conference publications. The conference and proceedings featured several contributions on the handicapped gifted, a topic which has received increased attention since. We sought and received funding from Canada's Solicitor General's Office (the federal agency that runs the prisons!) for a series of papers and colloquia addressing delinquency among the gifted, a topic which remains unique in having received such attention. We gave continuing support to the idea that giftedness is expressed in many ways, including many sessions on creativity (which became a central theme in 1987), and featured attention to often-ignored populations, such as Native Canadians and Native Americans.

Another related goal was to bring new faces and messages to the "gifted" community. By 1981 conferences on giftedness were increasingly frequent and the same prominent names were appearing on programs. We took a chance and brought five featured presentations that had not before been part of major conferences on giftedness. The opening speaker was Burten White of the U.S.A., who described the importance of infants' and young childrens' striving for competence in the development of abilities. Albert Jacquard of France warned his audience that the term "gifted" carries many perilous connotations, ranging from hereditary baggage to questions of privilege. Edward de Bono of the United Kingdom provided an explanation and demonstration of major ideas in his CoRT program in a keynote workshop. Henry Coker of Nigeria described how cultural values drive one's perception of giftedness, using the graphic example of one group of people who regarded the gifted as possessed by evil spirits, and how developing nations have an especially difficult balancing act in deciding how to allocate scarce resources, even in a crucial area such as education. The closing speaker, Alanis Obomsawin, National Film Board of Canada producer and a Native Canadian, or Abanaki as she would prefer, used film and song to em-

phasize that we cannot know the meaning of giftedness in a culture until we know that culture and respect it.

Organizers of each World Conference in sequence have had a strong feeling of contributing to an important and continuing tradition, even though, once underway, it is a surprisingly lonely enterprise. There are many memories of happy accomplishment, providing an enriching research and workshop program, as well as the invigoration that comes from renewed and new social contact with colleagues in the field. There is also a special sense of accomplishment that comes from such a Conference having a visible impact on the field. The 1981 meeting accomplished this in two ways.

Locally, the meeting has been acknowledged to have been the incentive for much interest in giftedness in the Province of Quebec, wherein Montreal is located. Progress has been slow but steady; however, several steps have been traced back to the conference and the world window it provided. The invited Ministry of Education representative reported back that something important was indeed happening out there, several consulting committees were established, and the beginnings of good programs are on their way. At McGill University, the host institution, we established our first demonstration summer school, now in its eighth year and expanded from kindergarten to the end of high school and operating in both English and French with active research and in-service components.

On a broader scale, we set the precedent for such meetings contributing to the financial well-being of the World Council, and set a record for attendance and national participation that held up until 1987 overall, but still stands in terms of the numbers of participants from outside the U.S.A. whose members' support has been the mainstay of every meeting. The World Council is a world organization and must meet in a variety of locations; it appears that a regular return to North America is helpful to the success of the organization and to its ability to meet elsewhere as often as possible.

Every conference also has its ''if only'' stories. We had two. First, the Canadian Post Office was shut down by a massive strike in the spring of 1981. How many registrations were lost due to our inability to communicate in writing, receive cheques, etc., can never be counted. After several weeks that problem was solved to our great relief, except days later the United States Air Traffic Controllers went on strike and were fired, throwing into chaos the travel plans of

the largest national block of registrants, many of whom cancelled in the face of the uncertainty. We were relieved and delighted with the final outcome, but wonder to this day what would have been our attendance (and balance sheet!) "if only" there had not been a mail strike and "if only" the air traffic controllers had not struck.

The World Conferences on Gifted and Talented Children are now a valuable and strong tradition in our field. It is so easy in education and its allied sciences to become totally absorbed in questions of local or narrow interest; these meetings help us keep a universal perspective and add to the enjoyment of our work. The most recent Salt Lake City meeting continued this tradition, and we look forward to Australia and the Netherlands ahead.

COMMENTARY ON THE SIXTH (1975) WORLD CONFERENCE IN HAMBURG

Harald Wagner, Co-Chairman

In the past, special measures for gifted children in West Germany have not been regarded as particularly important because of the assumption that their needs were adequately met through the traditional selective secondary school system.

During the past 25 years, educational reforms concentrated mainly on improving the educational opportunities of underprivileged pupils with the result that implementation of special measures for the most able students tended to be neglected.

Scientific and public interest in gifted children, their special problems and needs has risen only quite recently. Up to 1980, publications on gifted children could be counted on the fingers of one hand. Since 1979 researchers from the University of Hamburg have been the main initiators of a movement to intensify research and practical support measures for the gifted.

Many others have since contributed to these efforts and have established various research projects — most of them with the help of the Federal Government. A preliminary highlight of this development was — of course — the 6th World Conference in Hamburg in August 1985.

Since that conference even more initiatives have been launched to intensify support for very able students, mostly through enrichment programs, additional coursework in school, seminars for in-service teacher training, recommendations for increasing the number of students participating in federal contests in mathematics, science, computer science, foreign languages, etc. Recently a study has been completed on the further development of existing programs and prospects for new initiatives in this field, which hopefully will provide an agenda for further fruitful developments.

For the acceptance of such programs it is essential, however, to make it quite clear to the public that all measures for the gifted will have to be based on a thorough, optimal education for all students.

AN EMERGING FOCUS FOR THE STUDY OF
HIGH ABILITY: VERY EARLY DEVELOPMENT

Joan Freeman, President
The *E*uropean *C*ouncil for *H*igh *A*bility (ECHA)
University of Manchester, England

ECHA, the *E*uropean *C*ouncil for *H*igh *A*bility, is doing very well for such a new organization. To the Executive committee of our European organization we have just added two Eastern Europeans namely, Levcho Zdravchev of Bulgaria and Eva Gefferth from Hungary. Our intention is to provide a European conference during the even-numbered years between the biennial World Conferences of the World Council which are held in the odd-numbered years.

ECHA is concerned with the development of high level potential in people of all ages. It aims to spread acceptance of the idea that the highly able are different because of their abilities and are therefore deserving of special educational provision. The exciting part is that there is still a long way to go, with much pushing back of the frontiers of knowledge ahead.

There is already a sprinkling of associations for the highly able across Europe. ECHA is tapping into it, but it is also providing a brand new network for easier communication across national borders. Its major links are in the emerging set-up of national correspon-

dents, individuals who will coordinate the flow of information for their part of the world. Additional strength will come through international Special Interest Groups.

Activities: In this year, our first year, we have progressed to becoming a recognizable organization. We have directed a great deal of our energies into presenting the first ECHA Conference in November 10-13, 1988, in Zurich. The academic standard in it is high. The international publisher, John Wiley, and Sons, has agreed to publish a hard-back book of the best papers.

The next conference in 1990 is to be in a Socialist country, with first invitation to hold it in Moscow. Since then, it has officially been scheduled to be held from Thursday, October 26th through Sunday evening, October 28, 1990 in *Budapest, Hungary*. Call for proposals by January 15, 1990. Chairperson is Dr. Eva Gefferth, Institute for Psychology, Hungarian Academy of Sciences, Budapest, Hungary.

Indeed, there is a great demand for meetings to share the surge of new material to be discussed. The ways in which each country approaches the same problems, for example, invites comparison, so that all may learn of the best that others have found to be effective.

ECHA also plans to have a traveling colloquium, a smaller get-together, again alternately in East and West Europe probably in the odd-numbered years. The first is to be in Holland in June 1989, and its subject will be The Development of Cognition in the Context of European cultures.

The Consultancy: To increase communication, the ECHA is forming an ECHA Consultancy to offer information and advice. For example, it will provide library services and computerized assistance for teachers and parents, as well as a supply of individuals who are available for advice. From time to time the ECHA Consultancy will produce a monograph and learned articles on new developments.

Specific Projects: There will be other ventures, such as competitions for children in fine art, music, poetry etc. We are at present planning a summer camp for disadvantaged highly able children. A European research project is on the way.

ECHA Fellowships: High level professional standards in Europe are recognised in a variety of ways. Because ECHA is concerned with excellence, it is pleased to announce its own rewards to those who have distinguished themselves in the area. The object of the Fellowship is to encourage and recognize excellence. Educators, administrators and scholars who have made advances in research and develop-

ment, will be offered the honor of an ECHA Fellowship. In time, when the number of Fellows has reached ten, a college of Fellows will be instituted, which will have the task of electing others either to be members or visiting Fellows.

Governments: ECHA is working towards a policy for the highly able in Europe, and is already in communication with several governments. We are keeping them informed of positive ideas and practices, with the intention of stimulating wider understanding — sufficient perhaps to affect governmental decision-making.

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SOUTHERN AFRICA: ACCOMPLISHMENTS AND FUTURE PROSPECTS

Cedric Taylor

The single most important accomplishment of the last decade was the growing awareness and ultimately the official recognition of the need to provide educationally for gifted children. The pioneer in this regard was Jock Omond who not only started an Office for the Gifted and Talented in Port Elizabeth which provided Saturday programmes but who also embarked on an extensive lobby to convince the education authorities to include gifted education as a component of the official programme of differentiated education in schools.

In spite of other high education priorities, developing countries in South Africa have increasingly realized the importance of nurturing giftedness in its children as these children may develop into the much needed leaders and creative thinkers of tomorrow. Another important development in the multi-cultural countries of Southern Africa is the awareness that giftedness manifests itself in various forms and that this be acknowledged, valued and provided for.

The involvement of universities in the training of teachers of the gifted and the provision of special programmes for gifted children is a further accomplishment which contributes to the continuation of

gifted programmes in schools. An example of the commitment on the part of universities in this regard is the Diploma and Master's programmes for teachers of the gifted offered by the University of Port Elizabeth as well as their Academic Vacation School and Saturday programme.

Future prospects include the development of more satisfactory assessment procedures for the identification of gifted black pupils which may result in better utilization of the scarce resources and facilities available for gifted pupils. In a society where there is tension and violence between groups there is a growing awareness of the importance to get to know what the perceptions of gifted children are of the future and to build on this in the crafting of a better society for all. In a time of economic and cultural sanctions one hopes that gifted children may increasingly reach out across cultural and national borders and so contribute to greater understanding and peace among all people.

COMMENTARY ON CREATIVITY IN SOUTH AMERICA

Silvia Siqueira

I would like to thank Dr. Taylor for the opportunity of speaking to you, on behalf of the Latin American people, including those in my country, Brazil.

It has been a wonderful and enriching experience for me to participate at this 7th World Conference on the Gifted and Talented. During my next three minutes, I wish to tell you about my continent, my people, and the importance of creativity to us.

Brazil is the fifth largest country in the world; it's half of South America and has a borderline with all the South American countries except Chile and Ecuador. Even though it's the only Portuguese-speaking country in Latin America, only half of this population speaks Portuguese — the population of Brazil is that of 135,000,000. Half of the Brazilian population is under 18 years of age. Our youth is eager to learn and is thirsty for knowledge. From what I have learned in this conference, I am convinced that there is much hope for the improvement of my people if you, the intellectuals and educa-

tors, will help us provide opportunities for the growth and development of our gifted and talented.

Money makers are too often interested in exploiting our natural resources. However, we prefer to be shown how to develop our human resources.

South American countries were settled by the Spanish people. Brazil holds cultural agreements with all Latin American countries as well as with France, Spain, Italy and most certainly with Portugal. We were settled by the Portuguese and inherited their culture, values, religion and language.

I come from Sao Paulo, largest industrial and cultural center of the Southern hemisphere. It's a city of sixteen million, and more than half of the population is also under 18 years of age. *Education* should be a great priority in my country, but alas, it is far from reality!

The Brazilian Association for the Gifted in Sao Paulo has offered training for teachers, and school administrators with the quality of the teaching in public schools. We have also tried, in vain, to receive federal grants for research in the area of giftedness. Politicians' opinion seems to be that gifted and talented students will do well in school on their own. So, it seems to be difficult, but not impossible.

The highlight of our cultural events was the visit of Dr. Calvin Taylor to Sao Paulo, on May 17 & 18, 1987. He met with one hundred distinguished educators and researchers in the area of education, to discuss creativity and the multiplicity of talents. His short visit was of great value to all of us. We are planning for October, a workshop for School Directors on Leadership with another guest from the States, Rev. Frank Joseph Cody, S.J., PhD in School Administration. For 1989, we might have a Latin American Congress on Creative Talents.

Creativity for Brazilians is vital. In order to survive one has to know how to find alternate ways to achieve goals. Innovate, solve problems and be creative are basic demands for Brazilians' day to day living. That means, for instance, that a teacher who doesn't have the musical instrument for a rhythm band, will have broom sticks cut in smaller pieces for the children to keep rhythm to the music. She can also make rattles with bottle tops, and so on.

Unemployment is a real problem in Sao Paulo, so college graduates may find themselves doing activities that they didn't learn in school, but seem to be the possible solution for their financial problems. Brazilians are also creative in arts and crafts; handmade orna-

ments are popular and represent a source of income for many families. You may not understand what I mean by saying that one must be creative in order to survive; however, in very simple terms, my concluding words are the following: "If we can't afford to eat meat every day, we will go for rice and beans with chopped beef . . . bananas and more bananas . . ." Let's make the most out of what we have. Let's use our brains! Let's be creative!

The situation should not be different in the rest of the continent. We are a young population of good people who are ready to grow but we don't seem to be able to find the way to get there! The answer is — *Creativity*!

COMMENTARY ON THE FIFTH (1983) WORLD CONFERENCE IN MANILA: LATER HAPPENINGS AND PERSPECTIVES IN THE PHILIPPINES

Aurora H. Roldan, Chairperson

The Fifth World Conference on Gifted and Talented Children, at which many of you were present, was held in Manila on August 3 to 6, 1983. The theme of our conference was "Gifted and Talented Children, Youth and Adults: Their Social Perspectives and Culture" and this was also used as the title of our volume of Conference Proceedings.

That being the first time that an international conference on giftedness was held in Asia and in a developing country, we felt that it would be particularly appropriate to have such a special focus on the *social* and *cultural milieu* into which the world's gifted are necessarily born and by which they are influenced.

However, it took acts of great faith and determination for the Manila Conference to be held at all. Dr. Henry Collis, World Council President at the time of the Fourth World Conference in Montreal, and his Executive Committee exhibited much open-mindedness and very welcome moral support in helping me win the bid to host the conference in the Philippines. This was despite the understandable

objections and reservations which initially met my proposal since our country was still under Martial Law at the time.

That act of faith helped me win the World Council's approval, but it then took a tremendous amount of determination and resourcefulness on the part of myself and my staff to actually stage the Manila Conference. Unfortunately, most of the local institutions and agencies whose cooperation and assistance I had counted on left us to manage as best we could. In this regard, then, I must also express deep appreciation to the World Council officers and Executive Committee in 1983 for being so supportive of our efforts and understanding of our difficulties.

The 300 international delegates who did join us at the Manila Conference must likewise be commended for braving the long trip and the uncertainties of a nation under authoritarian rule. Your generous sharing of your knowledge and expertise sparked an awareness among developing nations such as ours that the exceptional abilities of our people are our greatest resource, and that a giftedness movement which develops those abilities could actually be a vital contribution to national growth and progress. We were inspired to recognize the wonderful gifts of mind inherent in every nation's youth and to strive for their enrichment. We were challenged to perceive that specialness, that ''more'' that is in us all.

In fact, just two and a half years after the Manila Conference, we Filipinos were given occasion to see that ''more.'' In February of 1985, we rose above ourselves and the day-to-day concerns which had made us complacent about our nation's plight. In a spontaneous outpouring of nationalistic fervor, we ousted a dictator of 20 years — and replaced him with Corazon Aquino.

Suddenly, political cunning, sophisticated machinery, and virtually unlimited resources were of no consequence. Suddenly, what mattered to us were Mrs. Aquino's far more precious gifts of moral courage, love of country and complete selflessness. She could very well have maintained the sheltered and luxurious life of a member of one of the wealthiest families in the Philippines. She could very well have left the awesome burden of national reunification and recovery to more seasoned politicians. But she chose country above self.

We, the people of the Philippines, could not help but respond in the same spirit. For those three remarkable days in February, 1985, no one was in it for himself. In fact, many now say that it was precisely that spirit of selflessness that made our ''People Power Revolu-

tion" the miracle that it was. For that brief moment in our history, we Filipinos surpassed—and surprised—even ourselves. And we were touched by the world's warmth and support.

But all too soon, harsh reality set in. The euphoria faded. Today, observers may even comment that it is as though those three days in February had never been.

But I appeal to the peoples of the world through you, the "best and brightest" of your respective nations, not to judge us too harshly. Believe me, we are the first to criticize ourselves when necessary. Instead, I ask you to give the Filipinos the chance to solve our own problems, right our own wrongs, overcome the difficulties that admittedly beset us from every side. *Ultimately, allow us to prove to the world—and most importantly, to ourselves—that our moment of national selflessness was all not for naught.*