Acceleration: Strategies and Benefits

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Overview

The purpose of this article is to describe ways of challenging gifted students through accelerative practice. Despite the overwhelming amount of favorable evidence, Daurio, 1979; Gold, 1965; Kulik & Kulik, 1983; programming experiences for the gifted encourage enrichment over acceleration. Gold (1965) wrote, "No paradox is more striking than the inconsistency between research findings on acceleration and the failure of our society to reduce the time spent by superior students in formal education" (p.238).

Stanley (1979) has classified enrichment as consisting of four types: busy work, irrelevant academic enrichment, cultural enrichment, and relevant academic enrichment. Busy work, which involves giving the student additional repetitive work is not enriching at all. The only lesson it teaches is for the student to work slower. Process Skills training involving activities intended to improve creative problem solving and decision-making abilities are deemed irrelevant because they don't pay attention to the particular academic needs of a student. Cultural enrichment, which involves taking gifted students to museums and ballets, is viewed as appropriate for appropriate for all children. Relevant academic enrichment would permit a third grader, who has mastered the third grade mathematics curriculum to begin studying the fourth grade curriculum. Unless the student's achievement is well-documented and combined with acceleration, this academically-relevant intervention merely results in a temporary postponement of boredom.

There are several benefits of providing accelerative opportunities. The most obvious benefit is the provision of appropriate curriculum challenge. Acceleration will reduce the amount of time a child is forced to study concepts that he or she already knows. Another benefit of acceleration is the opportunity for flexible curricular options. If a student could combine the content of two years into one year, there would be additional time in future schedules to pursue additional areas in the curriculum. There are also advantages in terms of reduced educational costs for both the school system and the student. If students spend less time in school, the cost of educating them will decrease. Currently in Calgary, schools are adopting year-round school scheduling tracks to accommodate more students without building additional school buildings. If acceleration were a common practice, the need for these administrative arrangements would decrease. Costs savings to the student can be quite dramatic when the accelerative approach saves the costs of university tuition. In addition to cost savings, acceleration can provide competitive advantages. As students compete for places in competitive undergraduate and graduate schools, their accelerative accomplishments will help them compile an impressive application package. Finally, there are benefits in terms of self-esteem. If an eighth grade student completes a university course with a grade of *A*, that accomplishment will help that student internalize an "ability" attribution. Rather than explaining the accomplishment, in terms of luck or simply hard work, the student would likely recognize ability as an instrumental factor.

This Proceedings paper will highlight the pioneering accelerative model developed by Julian Stanley and his colleagues at The Johns Hopkins University. It will also describe the Iowa Acceleration Scale (Assouline, Colangelo, Lupkowski-Shoplik, & Lipscomb, 1999) to determine if students would benefit through acceleration.

Smorgasbord of Accelerative Opportunities

The smorgasbord of accelerative opportunities model pioneered by the Study of Mathematically Precocious Youth (SMPY)at The Johns Hopkins University provides much evidence for the effectiveness of accelerative practices. (Benbow, Perkins, & Stanley, 1983; Brody & Benbow, 1987; Kolitch & Brody, 1992; Swiatek, 1993; Swiatek & Benbow, 1991a, 1991b). After using a talent search approach (Assouline & Lupkowski-Shoplik, 1997; Cohn, 1991; Olszewski-Kubilius, 1998; Stanley, 1976, Stanley, Keating & Fox, 1974; Van Tassel-Baska, 1984), which involves giving tests of sufficient difficulty to identify superior mathematical reasoners, SMPY encourages students to take advantage of numerous accelerative opportunities (Benbow, 1991; Stanley, 1977, 1979, 1991; Stanley & Benbow, 1986). Accelerative possibilities are limited only by the ability and motivation of the identified students. The more capable and motivated a student is, the more "radical" the accelerative possibilities.

SMPY has pioneered the use of fast-paced mathematics classes, whereby students learn several years of mathematics in one year (Bartkovich & George, 1980; George & Denham, 1976). Benbow, Perkins and Stanley (1983) reported that participants in SMPY's first two fast-paced mathematics classes scored significantly higher in mathematics portion of the Scholastic Aptitude Tests (SAT-M), expressed greater interest in mathematics and science, and accelerated their education much more than nonparticipants. Fast-paced classes can be geared to Advanced Placement exams (Mezynski, Stanley, & McCoart, 1983).). In Calgary, effective fast-paced math classes were implemented at F.E. Osborne Junior High School for several years (Pyryt & Moroz, 1992). Students completed the junior high math curriculum and Math 10 while in junior high school. In high school, they successfully completed Math 20 and Math 30 and had the flexibility in their timetables to pursue additional math classes or electives of their choice.

One of the most promising approaches for facilitating acceleration is the use of Diagnostic Testing followed by Prescriptive Instruction (DT-PI). This technique pioneered by Julian Stanley (1978, 1998) especially for mathematically and scientifically gifted students involves pretesting to determine a student's level of knowledge, analyzing errors to determine instructional needs, designing and implementing an instructional program to meet these needs, retesting using an alternate form of the initial test to determine mastery, and proceeding to the next level using the same approach

(Benbow & Lubinski, 1997). This approach has been successfully used to promote acceleration in both mathematics (Bartkovich & Mezynski, 1981) and science (Stanley & Stanley, 1986). During an intense three week summer institute, intellectually able students age 11-15 were able to learn the equivalent of a year of high school biology or chemistry of both using the DT-PI approach. Stanley (1998) suggests that computer programs could greatly facilitate the Diagnostic Testing - Prescriptive Instruction process. Followers of Renzulli implement a variation of the DT-PI approach when they use curriculum compacting (Reis, Burns, & Renzulli, 1992; Renzulli, Smith, & Reis, 1982; Starko, 1986) to shorten the time students spend mastering material.

At the high school level, the use of credit by examination is an effective way to accelerate one's progress in mathematics and science. One example of this approach is the Advanced Placement (AP) Program (Hanson, 1980). Students earn university credit based on their scores on an Advanced Placement examination. A grade of "3" on a 5-point scale will lead to the granting of credit at most universities. Selective universities require a grade of "4" or "5" before awarding credit. For students gifted in mathematics and science, there are examinations in calculus, computer science, biology, chemistry, and physics. The Advanced Placement Program provides content descriptions of the objectives that will be assessed on the Advanced Placement examinations. Nearly 10, 000 high schools worldwide offer courses geared to the content assessed on the AP examinations. Universities offer courses in summer institutes that prepare secondary teachers to instruct a specific AP course. Longitudinal studies have supported the effectiveness of AP courses for mathematically gifted students. Brody, Assouline, and Stanley (1990) found that Advanced Placement credits was the only statistically significant predictor of GPA, semesters on the Dean's list, and graduation honors in their study of early entrants at The Johns Hopkins University.

For some students, early entrance to universities (two years earlier than normal), part time university courses, correspondence courses and distance learning opportunities provide effective acceleration experiences. Students benefit from early entrance experiences (Brody, 1998; Brody, Assouline & Stanley, 1990; Brody, Lupkowski, & Stanley, 1988; Olszewski-Kubilius, 1995). In Alberta, the opportunity for early entrance will be affected by the opportunities for acceleration at earlier periods. At the University of Calgary, for example, students from Alberta are eligible for admission when they complete their Grade 12 coursework and diploma examination requirements.

Brody and Benbow (1987) have examined the effectiveness of the smorgasbord of opportunities model. Students who made use of accelerative options had higher college GPAs, won more honors, attended more selective colleges, and had higher career aspirations than students who decided not to make use of these accelerative options.

Iowa Acceleration Scale

Assouline, Colangelo, Lupkowski-Shoplik and Lipscomb (1998) have provided a counseling tool for evaluating the appropriateness of acceleration recommendations. There are four major dimensions in their approach: academic ability and achievement, school information, interpersonal skills, and attitude and support.

In terms of academic ability and achievement, the best candidates for acceleration are students with measured IQ scores of at least 145 and measured achievement of 1.5 to 2.0 years above current grade level.

A variety of school information is used to determine the appropriateness of recommendations for acceleration. Acceleration is supported when the acceleration will result in change to a new school building, preferably a new school district. Students with excellent attendance records are better candidates for acceleration than those with a history of school absences. A student whose physical size is larger than students in the present grade is a better candidate for acceleration than a student whose physical size is smaller than students in the present grade. A student with greater motor coordination than other students in the present grade is a better candidate for acceleration than a student with lesser motor coordination than students in the present grade. Students among the oldest in the present grade are better candidates for acceleration than students who are among the youngest in a grade. Those who take leadership in school extracurricular activities are deemed better candidates for acceleration than those who refrain from participating in extracurricular activities. Students who demonstrate motivation by comprehensive completion of assignments are deemed good candidates for acceleration. Students who seek academic challenges are also viewed as good candidates for acceleration.

The interpersonal skills dimension examines factors such as participation in non-school extracurricular activities, relationships with peers, relationships with parents, emotional development, behavior, parent involvement, and grade placement of siblings. Students with leadership in non-school extracurricular activities such as scouts or church groups are better candidates for acceleration than those who don't participate in such activities. Students who have positive relationships with agemates and older peers are good candidates for acceleration. Students with excellent relationships with teachers are better candidates for acceleration than those who have poor relationships with teachers. Students with have a positive and realistic self-image regarding their abilities can benefit from acceleration. Students without a history of discipline problems are better candidates for acceleration than students with such a history. Students whose parents are committed to collaborating with school personel in meeting their academic needs are better candidates for acceleration than students whose parents lack interest or involvement in their child's school progress. Students without siblings are the best candidates for acceleration. Problems may arise if siblings are in the same grade or happen to be one grade above the current placement.

The attitude and support dimension involves factors such as student's attitude toward acceleration, school system support towards acceleration, and prior planning for acceleration. Acceleration is recommended when both the student and the school show enthusiastic support for acceleration. Ideally, extensive discussions with school personnel regarding the student's placement have ocurred.

Assouline (1997) provides an interesting case study to illustrate how the *Iowa Acceleration Scale* facilitates decision-making regarding acceleration.

Summary

This paper highlighted some of the major benefits of acceleration. The smorgasbord of accelerative opportunities model pioneered by Julian Stanley and colleagues at The Johns Hopkins University was described. This model has generated a significant amount of research documenting its effectiveness. The *Iowa Acceleration Scale* was introduced as a tool for facilitate discussion and decision-making regarding acceleration. It is hoped that SAGE participants and readers of this volume will use the information to advocate for acceleration where appropriate.

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