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An analysis of multiple factors affecting retention in Web-based community college courses

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Abstract

The current study examined four factors affecting retention in Web-based community college courses. Analyses were conducted on student demographics, student learning styles, course communication and external factors. The results suggest that Web-based courses are more attractive to busy students who are also more likely to fail or drop the course. The combined results from the four factors provided evidence that time management and procrastination are the primary reasons that community college students fail or drop a Web-based course. The study also found evidence that inability to get feedback from instructors may contribute to student dropout and failure in Web-based community college courses.

Keywords: Distance education; Retention; Community college; Online

1. Introduction

Retention rates are an increasingly important issue for institutions of higher education. In addition to the traditional issues of wasted resources and lost enrollment, the United States Commission on the Future of Higher Education confirmed that college and university retention rates were under scrutiny as part of a review of federal funding (Dodge, 2006). As a result of this increased emphasis on retention, the traditionally lower retention rates in Web-based courses (Carr, 2000) are also under greater scrutiny.

While no national statistics have been reported for retention rates in Web-based courses, studies of individual institutions suggest they are generally 10 to 20 percentage points lower than in their comparable face to face counterparts. However, there is significant variation in retention rates among institutions. For example, in 2000 Tyler Junior College in Texas reported the completion rate for Internet-based courses was only 58%, while U.C.L.A. reported a completion rate of 87% (Carr, 2000). Some of this variance may be explained by the fact that community colleges typically have more non-traditional students than four year institutions.

As Muse (2003) noted, empirical studies of community college students and courses are scarce. The research that has been conducted typically focused on single variables such as student demographics or course communication.

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Therefore, the goal of the present study was to examine retention in Web-based community college courses from a perspective that included student demographics, learning styles, course communication and external factors.

2. Literature review

Research on retention in Web-based courses is generally divided into three main categories. The first category of research attempts to identify student attributes that predict student success or failure in a distance education course. The second category focuses on external factors that may affect a student's performance such as family, financial or job requirements. The third category of research deals with course attributes and curriculum techniques that may improve student retention.

2.1. Student attributes

In terms of student attributes related to retention, prior research has indicated that females tend to be more successful in online courses than males (Ross & Powell, 1990; Rovai, 2001; Whiteman, 2004). Rovai suggested these results could be explained by differences in communication patterns and sense of community between the genders. However, literature is not in complete agreement as Kemp (2002) found no correlation between gender and persistence in a Web-based program.

Varying results have also been found when investigating age as a predictor of success in a Web-based course. Whiteman (2004) and Muse (2003) found that older students were more likely to persist in a Web-based program. Diaz (2000) found that online students were older than traditional students, but did not find a significant relationship between age and retention.

In terms of learning styles, Doherty and Maddux (2002) found evidence that students who preferred a sequential learning style were more likely to complete a Web-based course than students who preferred a global learning style. Diaz (2000) demonstrated that successful online students were more strongly independent learners than were non-successful online students.

2.2. External factors

Bean and Metzner (1985) proposed a general student attrition model for non-traditional undergraduate students that make up a large part of the population of many community colleges. In their model, external factors such as employment and family are important factors in student attrition. This idea is supported by Parker and Greenlee (1997), who found that external factors explained why students did not persist. Their student satisfaction survey indicated that in order of importance, financial problems, followed by family complications, work schedule conflicts, and poor academic performance were the most important factors that explained why students did not persist. Kemp (2002) also found a correlation between work commitments and persistence. Because of these external factors, Rovai (2003) argued that one important factor of success in online courses is having enough time each week to complete all assignments.

Based on the importance of external factors, Diaz (2002) hypothesized that "many online students who drop a class may do so because it is the right thing to do". Diaz argues that because of the requirements of school, work, and/or family life in general, dropouts may have overcommitted. For these students, dropping out is simply a mature, well-informed decision. Reneland (2002) provided some empirical evidence for this theory. In a study of approximately 500 students, she found a majority of students who discontinued their studies considered "lack of time" to be the cause. This was followed by a "change in working conditions" and "other causes" such as illness.

2.3. Course attributes

Some researchers argue that course attributes such as technical reliability and course content are the key components affecting retention in Web-based courses. The distance education program at Royal Roads University reported anecdotal evidence that a high degree of technical support, along with high levels of student satisfaction with courses resulted in higher retention rates (Chandler, 2001). Muse (2003) also found evidence that a stable Web-based environment can contribute to student success, and suggested that students should become comfortable with the course management software before diving into the topic. A case study of graduate students at Boise State University found

that students who dropped out were dissatisfied with the learning environment because they did not feel confident that they were communicating effectively with the instructor or other students (Chyung, Winiecki, & Fenner, 1998). They found they could improve student satisfaction by redesigning the course with the following goals:

Guide learners in how to use the online tools
Make the distance education environment personalized and safe
Give learners clear expectations for both the learning process and outcomes
Learn as much as possible about individual students
Monitor individual performance
Help learners self-monitor
Provide immediate, frequent and regular feedback
Encourage interactivity among participants
Help develop self-regulated learning behaviors.

Literature has shown varying results on the relationship between course communication and socialization, and retention in a Web-based course. Rovai (2001) argued that building a classroom community through online communication with students could improve retention. Using anecdotal information, Prendergast (2003) suggested that retention in Web-based courses can be improved by designing courses to include collaboration with small groups of three to five students. Morgan (2001) also found anecdotal evidence that students responded favorably to increased communication from the instructor in a Web-based course, but could not confirm the results empirically. Morris, Finnegan, and Wu (2005) found evidence that successful students spent more time accessing both course content and course discussion than unsuccessful students. However, a study of 76 online undergraduate and graduate classes found no correlation between level of discussion interaction and student dropout rates (Tello, 2002).

2.4. Summary

In summary, the issue of retention in Web-based instruction is an important topic that has generated considerable research interest. Research has explored the relationship between retention in Web-based courses and student attributes, course attributes and external factors. The research results have been mixed, but there is sufficient evidence to suggest that all of these areas play a part in student retention in Web-based courses. In order to improve retention in Web-based courses, it is important to understand which of these factors can have the greatest impact on student success. The present study investigates the four areas of student demographics, student learning styles, course communication and external factors in combination in an attempt to identify the most useful factors for improving student retention in Web-based courses.

3. Statement of the problem

The purpose of this study was to gather empirical and qualitative evidence about factors related to retention in Web-based community college courses. The study investigated four research questions:

1. Is there a difference in demographic information between students who successfully complete a Web-based course and students who fail or dropout of a Web-based course?
2. Is there a difference in the distribution of learning styles as measured by the Index of Learning Styles between students who successfully complete a Web-based course and students who fail or dropout of a Web-based course?
3. What reasons do students provide for failing or dropping out of a Web-based course?
4. Is there a correlation between the amount of communication in a Web-based course, as measured by ratio of discussion postings and instructor e-mail, and retention rates?

3.1. Methodology

The study was conducted on community college students enrolled in Web-based courses during the fall 2005 semester at Truckee Meadows Community College (TMCC) in Reno, Nevada and Community College of Southern

Nevada in Las Vegas, Nevada. For the first question, demographic data was collected from both institutions' student information system for 10,466 students enrolled in courses designated as E-learning courses in their course identification number. Comparing successful to unsuccessful students created unequal comparison group sizes. Therefore Spearman's rank correlation coefficient was used to test correlations, as this test does not require equal sample sizes. Age, number of units enrolled in the current semester and total units completed were tested for correlation with successful completion of a Web-based course. A chi-square test was used to compare gender and successful course completion. Finally, a binary logistic regression was performed to test the amount of variance explained by the combination of these demographic attributes.

The second research question required a comparison between Web-based and face to face courses to determine if the results were unique to Web-based courses. To accomplish this, 74 courses were identified that were taught in both the Web-based and face to face format by the same instructor. These instructors were sent e-mail invitations, and instructors from 36 courses agreed to participate. The participating instructors posted survey invitations in their Web-based and face to face courses during the first two weeks of the semester. Some instructors offered extra credit points for completing the survey in an attempt to increase response rates, but this was not a requirement of the study.

The survey instrument was the electronic version of the Index of Learning Styles (Soloman & Felder, 1999). This instrument measures adult learning style preferences across four different dimensions: active/reflective, sensing/intuitive, visual/verbal, and sequential/global.

Three instructors had dramatically different response rates from their Web-based and face to face courses, and those courses were excluded from the sample. The result was a total of 426 voluntarily survey responses. A chi-square test was used to investigate learning styles differences between successful and unsuccessful students in Web-based courses, and differences between Web-based students and face to face students.

To investigate the third research question, an e-mail invitation was sent to students who failed a Web-based course during the fall 2005 semester at TMCC requesting completion of an electronic survey. While the e-mail approach had some drawbacks, it offered two important benefits. First, the relatively high mobility of the dropout population makes it difficult to contact them through a physical address. Second, it allowed a relatively low response burden on the part of the participants. This was important because the potential participants had failed or dropped out of a course, and they may be less likely to have the time or desire to respond to the survey. A total of 1107 survey invitations were sent and 52 students responded. This is a very low response rate and the results of the survey should be interpreted with caution. However, the low response rate was expected, due to the difficulties in contacting dropouts.

Data for the fourth research question was gathered from a random sample of 30 Web based courses offered during the fall 2005 semester at TMCC. Retention rates were calculated for each of the 30 courses based on a grade of D or better indicating a successful course completion. Withdrawals and F's were counted as not completing the course. Students who were auditing a class, or not seeking a grade, were included in class size to determine the ratio of messages per student, but they were not included in the retention calculations.

The Web server records for each of the 30 Web-based classes were examined to calculate ratios for number of communications per student. Two communication ratios were calculated. The first was total instructor communication, which included e-mails sent by the instructor and discussion group postings from the instructor. The second ratio calculated was total discussion postings, which included discussion postings from the instructor and students. E-mails sent from students were not included in the ratios as they were typically personal messages directed to the instructor.

4. Results

4.1. Student demographic results

For the first research question, valid demographic data was gathered from 10,446 students. Of those students, 56% passed all of their Web-based classes, 33% failed all of their Web-based classes and 11% had a combination of passed and failed courses. The students who passed some of their classes and failed others were excluded from the analysis, to provide independent samples. The analysis group consisted of 68% females and 32% males, with an average age of 28. The students in this group were enrolled in an average of 9 credit hours during the semester under study, and had completed an average of 30 credit hours in total.

Table 1
Successful completion by gender

	Female	Male
Passed all Web-based classes	64.5%	59.5%
Failed all Web-based classes	35.5%	40.5%

An analysis of gender differences between the two groups showed that 64.5% of females passed all of their Web-based courses compared to 59.5% of males (Table 1). A chi-square analysis shows that this gender difference is significant (chi-square = 21.803, $p < .001$). This finding is consistent with similar findings by Ross and Powell (1990), Rovai (2001) and Whiteman (2004).

A Spearman's rank correlation coefficient analysis also yielded significant results for age, number of credits enrolled in the current semester, and total credits completed. The results showed that the largest correlation was with total number of credits completed (rho = 240, $p < .001$), indicating that students who had completed more credits, were more likely to pass their Web-based course. This was followed by age, (rho = 134, $p < .001$), indicating older students were more likely to complete Web-based courses. The weakest correlation was with number of credit hours enrolled in the current semester (rho = −035, $p = .001$), indicating students with a higher credit load are slightly less likely to pass their Web-based course.

A logistic regression was performed to analyze the cumulative effect of these variables on the ability to predict student success in a Web-based course. The most accurate prediction was achieved when gender was excluded and credit hours enrolled in the current semester, total credits earned and age were included. All three of these variables were significant in the model, which correctly classified 68% of the students. However, this result was only marginally better than the null model, which correctly classified 62% of the students. A Hosmer Lemeshow test was performed to investigate the model's goodness of fit. A high probability value on this test indicates a good fit, and the results (chi-square = 337.049, $P < .001$) revealed the model was a poor fit.

Based on these findings, the answer to the first research question is that there is a difference in student demographic information between students who successfully complete a Web-based course and students who fail or dropout of a Web-based course. Individual correlations were found for gender, age, total credits earned and credits enrolled in the current semester. However the individual correlations were weak and the combination of the variables does not provide a useful model for predicting student success.

4.2. Learning styles

For the second research question, valid learning styles data were collected from 426 students, with 215 responses from Web-based courses and 211 responses from face to face courses. As shown in Table 2, 71.6% of the face to face respondents and 75.3% of the Web-based respondents were successful in their class. The pass rate of the respondents from the face to face courses was not significantly different from the 72% overall retention rate for the institutions (chi-square = 0.24, $p = .878$). However, the 75.3% pass rate of the respondents form the Web-based courses was significantly different than the 64% average success rate for Web-based courses at the institutions (chi-square 11.65, $p = .001$). As a result, Web-based students who did not successfully complete their course were under-represented in this portion of the study. The most important implication of this response pattern is that the learning styles data may not be valid.

Table 2
Learning styles survey responses

Course type		Pass	Fail	Withdraw	Total
Face to face	Count	151	28	32	211
	Percent	71.6%	13.3%	15.2%	
Web-based	Count	162	27	26	215
	Percent	75.3%	12.6%	12.1%	
Total	Count	313	55	58	426
	Percent	73.5%	12.9%	13.6%	

Table 3
Main reason students chose a Web-based class

	Count	Percent
I don't have time to attend a regular class.	19	37%
I prefer Web-based courses to classroom courses.	11	21%
The campus class was not offered at a time I could attend.	8	15%
It was not practical for me to come to the TMCC campus.	8	15%
Other	4	8%
The Web-based section was the only class available.	2	4%

However, this response pattern also indicates that unsuccessful Web-based students responded at a lower rate than successful Web-based students.

No significant differences were found in the distribution of learning styles between students who successfully complete a Web-based course and those who do not. A comparison of Web-based students to face to face students also failed to show any significant differences. Therefore, the answer to the second research question is there is no difference in the distribution of learning styles between students who successfully complete a Web-based course and students who fail or dropout of a Web-based course.

4.3. Student reasons for failing or dropping

The majority of the 52 students who responded to the e-mail survey had significant experience with Web-based courses. Only 15% of the respondents were involved with their first Web-based course and 52% of the respondents had taken 4 or more Web-based courses. The majority of respondents were also employed, with 62% indicating they worked 30 hours or more per week.

To assess the self-reported reasons for failing or dropping a Web-based course, four related questions were included in the survey. The first two questions sought information about students' motivation for taking a Web-based course (Table 3). The first question asked students to identify their one main reason for choosing a Web-based course. The largest group (37%) stated that they did not have time to attend a regular class. The next largest group (21%) indicated they preferred Web-based courses to face-to-face courses. Those who responded 'Other' indicated they had either a temporary or permanent disability that made Web-based classes a more attractive option.

The next survey question sought to gather more information on why students might prefer Web-based classes (Table 4). Students were given seven choices of possible advantages of a Web-based class, including an 'Other' option. Respondents were allowed to select multiple options. The most popular answer (31%) was that Web-based courses allowed students to work during the hours that fit their schedule. This was followed by not having to come to campus (26%) and working at their own pace (20%). Only 9% of the respondents indicated they could finish a class more quickly in a Web-based format. Only 14% of the responses dealt with dissatisfaction with the traditional classroom lecture and interaction with students.

The next two related questions were designed to assess students' self-reported reasons for failure or withdrawal from a Web-based class. The first question asked them to indicate the main reasons they failed their class by choosing from a list of eight options (Table 5). Respondents could choose more than one option and an 'Other' category was available if none of the options were suitable. The largest percentage of students (21%) indicated that they did not have enough time

Table 4
Students' perceived advantages of Web-based courses

	Count	Percent
I don't have to come to campus.	40	26%
I can work at my own pace.	30	20%
I can finish the class faster.	14	9%
I don't have to deal with other students.	11	7%
I don't have to deal with classroom lectures.	10	7%
[Other]	0	0%

Table 5
Main reasons students reported for not being successful in the class

	Count	Percent
I put off my Web-based assignments and got behind.	14	19%
Other	13	17%
I had trouble staying motivated in the Web-based class.	7	9%
I was not able to get enough help from the instructor.	7	9%
There was too much reading required.	6	8%
The course material/topic was too advanced for me.	5	7%
I had difficulty understanding the requirements and/or due dates.	5	7%
I had trouble with the computer and access to class information.	2	3%

for the course. This was followed by 19% of the respondents who indicated they put off their Web-based assignments and got behind. Of those selecting 'Other', five of the reasons were related to not having enough time for the course. Four students indicated the Web-based learning environment did not meet their needs for understanding the specific topic, and two students indicated problems with the instructor. One student simply did not need the class and dropped it.

The second question asked students to identify disadvantages of Web-based courses, as these were believed to be related to students' reasons for failing or dropping the course (Table 6). Overall, students indicated they thought that communication was more difficult in a Web-based class. Lack of contact with the instructor (25%), inability to get questions answered (18%), and lack of contact with classmates (11%) were all noted as problems. A large group (23%) also noted that it is easy to procrastinate in a Web-based course.

Based on these results, the answer to the third research question is that students report time management and procrastination as the primary reasons for failing or dropping a Web-based course. The reasons students reported for selecting a Web-based course also supported the idea that time management was an issue for unsuccessful students. Lack of communication with the instructor was also noted as a problem. Unlike past research, technology problems did not appear to be a significant problem for this group of students.

4.4. Course communication

To evaluate the correlation between course communication and student retention, two types of communication were counted for each of the 30 courses sampled for this research question. The first was a count of the total instructor e-mails and discussion posts. The second was a count of all instructor e-mails and all instructor and student discussion posts. Both counts were divided by the number of students in the class to obtain the ratio of postings per student. No correlation was found between student retention rates and either of these ratios. The scatter plots shown in Figs. 1 and 2 illustrate the lack of correlation. Some courses with very high communication ratios had very low retention rates and vice versa. Based on these results, the answer to the fourth research question is that there is no correlation between the amount of communication in a Web-based course and retention rates.

5. Discussion

The individual results of the present study have confirmed or clarified findings of prior research on the relationship between retention and student demographics, learning styles, course communication and external factors. However, the

Table 6
Students' perceived disadvantages of Web-based courses

	Count	Percent
It's easy to put the class off with no scheduled meeting times.	28	23%
I am not able to get answers to questions like I could in a class.	21	18%
I don't have as much contact with classmates.	13	11%
It is difficult to keep track of deadlines and what work is required.	10	8%
They require too much reading.	9	8%
They are boring and dry.	9	8%

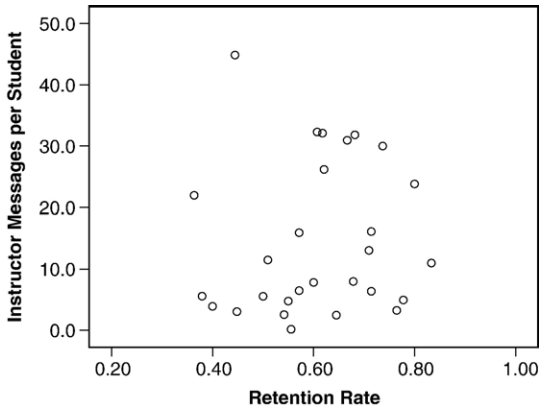

Fig. 1.

primary benefit of this study comes from viewing the results as a whole. Viewing retention issue from all three perspectives simultaneously revealed three common themes that were supported from multiple perspectives.

5.1. Over-commitment

The first theme supported by these results is that a majority of community college students who fail or withdraw from a Web-based course have scheduling or time management issues. The most significant evidence for this theme came from the results of the survey of unsuccessful students, where responses to all four questions supported this conclusion. The majority of respondents chose answers related to lack of time for the course, or procrastination as their major reason for failing or dropping the course. These results correspond with Reneland's (2002) findings that the majority of dropouts reported lack of time as the cause. Respondents in the present study also indicated their primary reason for choosing a Web-based course was that they did not have time for a regular class. Further support comes from the fact that a majority of respondents preferred Web-based courses because they could work around their schedule, but saw procrastination as the main disadvantage of Web-based courses.

As mentioned above, the response rate to the student survey was very low, and these results must be interpreted with caution. However, the student demographic data and learning style survey response patterns provide additional support for this conclusion. The finding that the majority of respondents worked 30 or more hours per week corresponds with previous findings (Muse, 2003) and indicates that these students must juggle job-related requirements with their academic work. The weak, but significant correlation between number of credits taken during the current semester and success in a Web-based course provides evidence that school workload may also be a contributing factor.

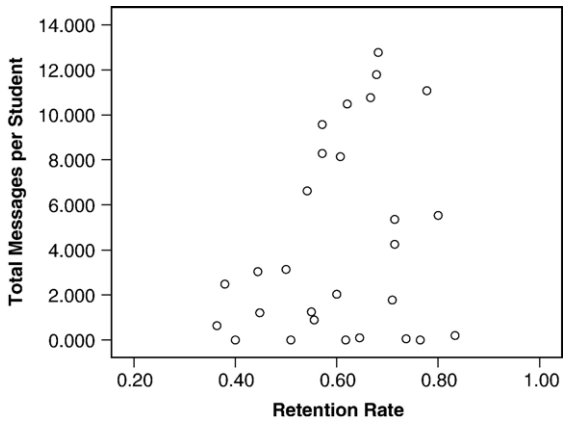

Fig. 2.

The significantly lower response rates to the learning styles survey by unsuccessful Web-based students also supports the idea that these students are overcommitted. The results indicate unsuccessful Web-based students were less willing to respond than successful Web-based students, which corresponds to previous research (Morris et al., 2005). However, in the present study unsuccessful Web-based students also responded at a lower rate than unsuccessful face to face students. This is notable because Web-based students were already on-line when they received the electronic survey, while students in face to face courses were typically required to access the survey at a computer outside of normal class time. As with the Morris et al. (2005) study, the actual reason for these lower response rates is not known. However, when viewed in the context of the demographic and student survey results of the present study, one reasonable explanation is that unsuccessful Web-based students felt they were too busy to complete the survey.

In summary, the analysis of student demographics, learning style survey response patterns, and surveys of unsuccessful students provide three different perspectives on the reasons students may fail or drop a Web-based course. The results from each of the three research questions provide evidence that many Web-based community college students have time management issues. In combination, these results support Diaz' (2002) hypothesis that because of the requirements of school, work, and/or family life in general, dropouts may simply have overcommitted.

5.2. Self-selection

The idea that overcommitted students are less likely to be successful in a Web-based course is fairly intuitive. However, it becomes an important factor when it is combined with the second theme identified in this study. The student survey results indicate community college students who are overcommitted may be self-selecting Web-based courses. Unsuccessful students in this study indicated their favorite attribute of Web-based courses was that they could work on the class during the hours that best fit their schedule. They also noted their primary reason for selecting a Web-based course was that they were too busy for a regular class. Taken in combination, the students' responses provide evidence that Web-based courses are more attractive to very busy students. As noted above, these are the same students who are most likely to fail or drop the course.

Because a face to face course requires students to re-arrange their life to accommodate the class, busy students are naturally attracted to the flexibility of Web-based courses. In fact, many colleges and universities actively promote the concept that Web-based courses are well-suited for busy adults who feel they do not have time to come to school. However, the flexibility offered by a Web-based course also makes it easier for these busy students to over-commit or procrastinate on course work, leading to failure in the course.

5.3. Effective instructor communication

The third theme that emerged from the results is that communication with the instructor is an important factor in student retention in Web-based courses. While quantitative results did not show a correlation between retention rates and the amount of student communication, the survey results indicate qualitative factors may be important. The most frequently selected disadvantage of a Web-based course was the fact that students do not have as much contact with the instructor. A large number of respondents also indicated that they were not able to get answers to questions as well as they could in a face to face course. Additional evidence came from respondents who indicated the primary reason they were not successful in their courses was that they were not able to get enough help from the instructor. These results also correspond to previous findings by Morgan (2001) and Prendergast (2003) who noted the importance of timely and helpful responses in improving student retention in Web-based course.

The survey results may explain the lack of correlation in the quantitative results. Courses with low levels of communication and high retention rates may have had more effective communication. These results may also be related to the first two themes. Students who are overcommitted or procrastinating are likely to be working on assignments and seeking help at the last minute. These students may be posting questions, but may not be allowing a reasonable amount of time for a response. The result is that the responses may come too late to be helpful.

5.4. Limitations of the study

As noted above, one of the limitations of this study was the skewed distribution of the responses to the learning styles survey. Since the sample included a much larger percentage of successful students than the population, the

learning style results may be suspect. Small sample sizes also necessitate cautious interpretation of the results from student surveys and the review of course communication.

6. Conclusions and recommendations

The results of the current study suggest two methods for improving retention in Web-based community college courses. The first method is to use advisement to discourage over-committed or procrastinating students from enrolling in Web-based courses. The second method is to use effective instructor communication based on frequent deadlines to discourage procrastination by busy students who do enroll in Web-based courses.

The first challenge for educators is to develop appropriate advisement techniques to deal with over-committed students selecting Web-based courses. The flexibility of a Web-based course provides a valuable educational opportunity for busy students. It also provides enrollment growth opportunities for colleges and universities who serve these students. However, allowing students to fail or drop a course because they are too busy is counter-productive to both the student and the institution. Instructors and counselors must recognize that some busy students may be productive enough to handle the workload, while others may not. Therefore, educators must carefully develop advisement techniques that discourage students who are not able to manage their time, without discouraging students who may be able to handle the workload.

As Prendergast (2003) suggested, a comprehensive pre-course discussion of the workload required by the course is one way to address this problem. This would ensure that potential students have enough information to form a realistic understanding of the time commitment required. This type of briefing could help students to make better decisions about their workloads before enrolling in a course.

It may also be useful to provide a frank discussion about the difference between flexibility and workload. While Web-based courses provide time flexibility, they do not typically reduce workload. Some students may have the mistaken impression that because they do not have to spend time in a classroom lecture, the will have to spend less time on the course. Typically, this is not the case. Students in Web-based courses should understand that they will have to get all of their information through reading, viewing presentations, or working on-line with their instructor and peers. They should also understand that this can be a time consuming process.

Students who do make an informed decision to enroll in a Web-based course could still be prone to time management or procrastination problems. The qualitative results of this study and previous studies by Morgan (2001) and Prendergast (2003) indicated timely and helpful feedback from the instructor may also improve retention rates for these students. To be most effective in improving retention, instructor communication should be designed specifically for the busy students who are attracted to Web-based courses.

One way of accomplishing this is to structure communication patterns around course deadlines. Frequent course deadlines that are monitored by the instructor and accompanied by feedback to students on their progress can discourage procrastination. Instructors in Web-based courses should consider scheduling these due dates and times to correspond with times they will be on-line. This increases the probability that they will be able to provide a timely response to students who are working at the last minute. Some may argue that this communication process enables procrastinators. However, it also provides several opportunities to coach procrastinating students and help them develop better self-regulated learning behaviors.

In summary, the present study found evidence that time management and scheduling issues are often the main reason that community college students fail or dropout of a Web-based course. The fact that these busy students find the flexibility of Web-based courses attractive creates a challenge for educators. Research has provided evidence that retention rates may be improved through providing students with thorough course orientations, and frequent instructor feedback. However, more research is required to quantify the effectiveness of these techniques.

Because community colleges have lower retention rates for Web-based classes, future research should be focused on this population. Additional quantitative research is required to establish that pre-course orientations can truly improve retention in Web-based courses for this population. Qualitative research is also necessary to identify specific types of advisement that are most effective in helping students make better time management decisions.

Additional research is also required to verify the specific attributes of instructor feedback that can improve retention rates. Investigations of qualitative factors such as timeliness, frequency, tone and content of communications can identify specific techniques that could improve retention. Finally, quantitative and qualitative studies of course deadlines and monitoring of student progress could determine the effectiveness of these techniques in discouraging procrastination and improving Web-based retention rates.

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