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EDITOR'S NOTES

SPECIAL ISSUE: THE IMPACT OF TECHNOLOGY ON PERSISTENCE

Because of the changing face of undergraduates on higher education campuses, student persistence has become a much-studied area among higher education researchers and administrators. With this change comes the need to explore ways in which institutions can positively impact the retention of students. The tremendous growth of information technology has lead to new pedagogical changes that many believe will address student persistence. Distance education and, specifically, the use of online courses, are examples of such pedagogical changes that are occurring to deal with these emerging issues related to student withdrawal. While several theoretical models have been utilized to explain student persistence at two- and four-year institutions, the research related to dropout behavior among students impacted by e-learning approaches is somewhat limited. The purpose of this special issue is to examine the impact of technology on long-term, as well as course, persistence of college students within the context of current persistence theory.

Nora and Snyder (*Technology and Higher Education: The Impact of E-Learning Approaches on Student Academic Achievement, Perceptions and Persistence*) begin the special issue with an overview of the literature concerning technology at the postsecondary level. The discussion focuses on the number of uses of technology in the classroom, its impact on student attitudes and the direction of technology in higher education. The second article by Sutton and Nora (*An Exploration of College Persistence for Students Enrolled in Web-enhanced Courses: A Multivariate Analytic Approach*) converges on college students enrolled in Web-enhanced courses and examined the impact of that mode of instruction versus traditional methods of instruction on the adjustment, achievement, and persistence of college students. Because of the exponential growth in the number of collegiate courses offered online, the third article

by Finnegan, Morris, and Lee (*Differences by Course Discipline on Student Behavior, Persistence and Achievement in Online Courses of Undergraduate General Education*) utilizes a mixed-method approach to examine reasons for differences in course dropout rates between students enrolled in online courses as compared to in-class courses. The next article by Morris and Finnegan (*Best Practices in Predicting and Encouraging Student Persistence and Achievement Online*) précis four research studies on undergraduate students as well as on faculty engaged in fully online courses to generate best practices focusing on teaching and learning online. The studies that were investigated specifically examined the relationship of student background variables and online behaviors to student persistence and achievement in an online environment.

The two remaining articles in this special issue shift the focus from one of transforming teaching through technology in the classroom to much broader institutional reform as a means of affecting student persistence. McCracken (*Best Practices in Supporting Persistence of Distant Education Students Through Integrated Web-based Systems*) examines the support needs of students exclusively studying in a virtual environment. The author establishes the unique characteristics that demand a redefinition of academic programming and emphasizes the integration of institutional systems in order to ensure virtual students have access to comparable educational resources, experiences, and environments as their on-campus peers. The scope of online instructional delivery must be expanded to include an array of academic support systems that have been identified as critical to ensuring that virtual learning environments are inclusive, accessible, instructive, and responsive to changing student needs. The last article by Clay, Rowland, and Packard (*Improving Undergraduate Online Retention through Gated Advisement and Redundant Communication*) focuses on the results of a survey that was developed to establish the causes of eCore attrition after carrying out a comprehensive orientation and advisement program and redundant communications to students.

We hope that this special issue will provide a comprehensive review of sound, empirically-based studies in the literature on the influence of technology in the classroom, on institutional support systems, and academic programming in higher education institutions.

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Special Issue Editor

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BEST PRACTICES IN PREDICTING AND ENCOURAGING STUDENT PERSISTENCE AND ACHIEVEMENT ONLINE*

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ABSTRACT

Four research studies of students and faculty engaged in fully online undergraduate courses are analyzed to generate best practices for teaching and learning online. These studies investigated the relationship of student background variables and online behaviors to student persistence and achievement in the online environment. Over 500 students enrolled in lower division, undergraduate courses offered online were included in the analyses. The courses were designed by faculty and instructional design experts and met standards of quality course design established by the offering colleges and universities. By combining the results of the study, guidelines for advising students and faculty for success in the online environment emerged.

INTRODUCTION

Web-based, online education is growing exponentially in higher education. A report by the Sloan Consortium revealed that over 3.5 million U.S. students took at

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least one online course during fall 2006, representing nearly 20% of all U.S. higher education. Nearly 35% of all higher education institutions in the United States are considered fully-engaged in offering online courses and programs. That is, they believe that their online offerings are strategic for their institution and they have fully incorporated online into their formal long-term plan (The Sloan Consortium, 2007). Of concern, however, is the fact that many students are not successful in completing courses in the online environment; consequently, dropout rates are higher than in comparable face-to-face classes (Diaz, 2002; Parker, 1999). Although the literature is replete with books giving prescriptive advice to faculty teaching online, many researchers (Nachmias & Limor, 2003; Rafaeli & Ravid, 1997; Zaiane & Luo, 2001) increasingly emphasize the need to understand empirically student behavior and performance online to discover what actually happens in the online environment and to establish research-based linkages between student behavior, faculty behavior, and student persistence and success online.

This article combines findings from four studies conducted with students and faculty in fully online undergraduate general education courses offered by the institutions in the University System of Georgia (USG) to generate best practices for teaching online. The studies investigated the relationship of student background variables and online behaviors to student persistence and achievement in the online environment. Faculty members from across the 35 institutions within the system with assistance from instructional designers and multimedia experts designed the courses using a consistent template and design standards. Through this standardization, it is assumed that course design issues are minimized as a factor in student persistence and achievement.

Courses last a single semester and enroll from 10 to 25 students per course. Collectively, the four research studies focused on student experiences and persistence in the online environment and faculty experiences and practices.

Both qualitative and quantitative methodologies were utilized in data collection. Three of the research studies investigated student and faculty behavior online through an analysis of behaviors in the online environment based on course logs and archived discussion boards. A fourth study gathered perspectives from over 100 students enrolled in the core courses. As a group, these studies provide empirically-based guidelines to encourage student persistence and achievement in the online environment.

STUDY 1: TRACKING STUDENT BEHAVIOR AND ACHIEVEMENT ONLINE

Researchers and program administrators were interested whether data collected when students and faculty interacted online could be used to identify trends leading to success in the online environment. This first study investigated student behavior by tracking what they do online and how long they spend on each

activity. Data were collected over three semester using 13 sections of English, U.S. History, and Geology. Over 400 students were tracked, and slightly over 200 were successful completers; that is, the student finished the course with a passing, transferable grade. Others withdrew from the course or exited with a lower than passing grade.

Student access tracking logs found in archived online courses were analyzed. Data collected on each student included:

1. which content pages were visited;
2. what tools were used;
3. which discussions were read; and
4. which were created and replied to.

Each piece of data included a timestamp that allowed researchers to calculate time spent on a task. Data were coded into the number of times (frequency) an action was taken, and how long (duration) the student spent in the activity. Frequency and duration for the variables of participation were calculated for each student. Individual data were then aggregated by and across courses for successful completers, unsuccessful completers, and withdrawers. Statistical analyses (e.g., *t*-tests and regressions) were conducted to explore the relationship of student participation to persistence and achievement.

Over three semesters, the enrolled students viewed over 198,000 discussion postings and over 99,000 content pages; they created over 5,500 original posts and 9,500 follow-up posts, yielding over 300,000 coded activities. There was a statistically significant difference in the behaviors of completers and withdrawers. Completers engaged in online learning activities with greater frequency and greater amounts of time than students who completed the courses but did not earn passing grades. Those students who did not persist did not participate to any meaningful degree, either by viewing content or participating in discussions.

These data suggest that students need to be told that time on task matters, both where they go in a course and how often, matters. Successful students view discussion posts and content pages regularly. Successful students also spend more time viewing (reading) discussion posts. We propose that this is a measure of greater student involvement and should be encouraged.

These data suggest that best practices for online instructors include:

1. using the tools available to track where students are going in the course, how often, and when;
2. giving students feedback on their participation vis-à-vis other students in the course; and
3. using aggregated data collected over time to establish course norms for student behaviors (i.e., instructors could inform students of how much time the average, successful student spent in the online environment and the behaviors they exhibited).

If the instructor emphasizes his/her managerial role (Berge, 1995), as well as pedagogical role, by directing students to important content pages, giving feedback on participation, and helping students to understand the layout of a course, it is possible that more students might be retained and be successful in the online classroom (Morris, Finnegan, & Wu, 2005).

STUDY 2: PREDICTING STUDENT RETENTION ONLINE

This study focused on the relationship of nine student academic and demographic background variables and student locus of control in predicting completion or withdrawal from online courses. Researchers and program administrators hoped to learn whether data collected as part of a student's admission to a program or course could be used to predict how well they would perform in courses, and thus be used as an advisement tool. Previous studies found that successful online students exhibited a higher GPA prior to enrollment in the online course than unsuccessful students (Diaz, 2002). Additional research showed that students with high internal locus of control were more likely to persist in distance education (Dille & Mezack, 1991; Liu, Lavell, & Andris, 2002). Parker (1999) suggested that identification of a consistent set of persistence variables might assist counselors and faculty in placing students in appropriate educational settings, and thus increase retention. The participants in this study were students across five semesters who enrolled in online courses covering the humanities, natural sciences, and social sciences. Study participants were asked to complete Rotter's (1966) internal-external (I-E) locus of control instrument, and data on demographic (e.g., gender, age) and previous academic performance (e.g., high school GPA and SAT scores) were collected from the student information system.

Using only students' demographic and academic variables, a two-group Predictive Discriminant Analysis (PDA) was able to predict whether a student would complete or withdraw from a course with an accuracy of 62.8%. High school achievement (high school GPA) and mathematic ability (SAT-M) were found to be the most important predictors in this analysis. A subsequent analysis focusing on locus of control and availability of financial assistance predicted students' group membership with 74% accuracy. Similar to Parker's (1999) findings, these two variables were considered to be significant predictors of students' completion or non-completion in distance education.

This study suggests that faculty should be aware of student's prior academic experiences and that students with lower grade point averages may need individual assistance within the course and academic assistance outside of the online course to succeed. The recognition of the need for academic enhancement centers for face-to-face students is clearly established, and the same referral possibilities may be necessary for online students. Additionally, this study found

that a student's success online can be affected by his belief in his ability to take control (or not) of the environment. Students with high internal locus of control did significantly better in the online environment than students with external locus of control. A related study (see Study 3 below) found that non-completers were often frustrated and felt "things" were beyond their control in the online environment, while completers reported persisting in the face of problems (technological, academic, and otherwise) and finding a way to overcome obstacles. Clearly, instructors need to be aware of the role of student attitude and motivation to successful completion. Best instructional practices would include helping students understand the "non-academic" reasons for failure to persist and providing steady guidance and encouragement early in the term.

STUDY 3: STUDENT PERSISTENCE AND SATISFACTION IN THE ONLINE ENVIRONMENT

Although the two aforementioned studies were useful in predicting student persistence based on past academic performance and course-related behaviors, the researchers realized that other factors also affected retention and this study was designed to examine student satisfaction and persistence in the online environment from the perspective of the student. In particular, researchers were interested in learning directly from the student why some students dropped out of online courses while others remained, and in identifying strategies that might be employed to improve the likelihood of student retention. Previous research revealed that students with positive attitudes about coursework specifically, and life in general, tend to dropout less than students with poor attitudes do (Kemp, 2002; Loomis, 2000).

Both qualitative and quantitative data were collected to answer the research questions. A survey probing instructional reasons for withdrawing from a course was mailed to 230 students who withdrew from online courses and to 275 students who completed online courses. Twenty-five percent of withdrawers and 19% of completers responded. Telephone interviews were conducted with 16 students, eight who withdrew and eight who completed the courses.

The findings from completers suggested a number of factors and characteristics were important to their success, including self-reliance and persistence, the flexibility in the asynchronous environment, time-on-task, procedural clarity, and faculty involvement and feedback. Students who were successful felt that they were "members" of the course. Persisters spoke of overcoming problems in the learning environment and just "sticking with it" until they figured things out, and "not giving up." Several of the completers described liking to "work at their own pace" while acknowledging that deadlines do exist. Some said that the online asynchronous environment "was perfect" for accommodating jobs and staying at home with small children and other commitments. Completers

tended to view problems with online courses as *something to overcome,* while withdrawers tended to view problems as *a rationale for leaving* a course.

Unsuccessful students needed more course management assistance to learn the course layout, understand expectations and assignments, and locate content and resources. A seemingly "confusing layout" and "unclear instructions" affected persistence for these students. Several students noted "I didn't know what [the instructor's] expectations were." Non-completers often were confused about assignments and how assignments were graded. They also desired more technical assistance than instructors often anticipated. Withdrawing students often dropped the course early in the semester and, interestingly, the reasons were largely not content-related, but rather a feeling of being lost of overwhelmed in the course.

A faculty presence online and faculty participation were important to the online students. Completers were more satisfied with the feedback they received than non-completers. The completers expressed a "sense of belonging" to the course, and this differed sharply from withdrawers who resented the practice of regularly logging onto a course site. Completers seemed to adapt to the pace and flow of online courses, while withdrawers became frustrated and made many comparisons to the structure (i.e., time) of face-to-face classes.

Based on the study, a number of best practices for faculty emerged:

- A comprehensive orientation at the beginning of the semester may reduce confusion about the course layout and expectations.
- An explicit and repeated online discussion about the course goals and procedures may be useful in the first weeks even when these are clearly stated in the course syllabus and on the Website.
- The instructor's enactment of social and managerial roles may be more important to some students than pedagogical feedback.
- Early in the semester faculty should maintain consistent contact with all students and encourage them to build their self-reliance and group reliance (perhaps affecting their locus of control orientation).
- Faculty may also need to act as a liaison to technology assistance for the students in order to limit dropouts and encourage persistence. Basic rules of good Web design should be followed in online courses.
- Discussions are important and should be considered carefully as tools for retaining students.

STUDY 4: PERSPECTIVES OF FACULTY TEACHING ONLINE

The three previous studies focused almost exclusively on the student experience from a variety of perspectives, and the researchers identified best practices for faculty based on these findings; however, it was important to consider the faculty role and perspective in building the learning environment and encouraging retention. This final study examined the roles that faculty enact while teaching online. This study relied on two primary data sources: semi-structured interviews with

faculty teaching online and an analysis of archived online courses taught by those interviewed. The interviewed instructors represented 11 institutions and seven disciplines in the humanities and social sciences. Ten of the 13 instructors had taught online for three or more terms (experienced), and the remaining three were in their second online course at the time of interviews (novice). Class sizes averaged 20 students. In addition, the discussion boards of 10 archived courses were analyzed for evidence of faculty roles in the online environment. Researchers wanted to learn how instructors perceive their roles in the online environment and, based on their behaviors, the roles the instructors enacted.

This study used Berge's (1995) taxonomy of faculty roles as its theoretical framework. Berge postulated faculty enact four different roles when teaching courses: a social role, a pedagogical role, a management role, and a technological role. Because faculty were provided with a technological advisor when teaching these courses, this study did not focus on that role.

This study found that there were distinct differences in the roles enacted by experienced online faculty as compared to novice online faculty. Novice instructors most frequently enacted a management role to a limited degree, and rarely posted a comment classified as "pedagogical." Examples of managerial postings included directions for completing assignments, recommendations for getting help with finding examination sites, and reminders of sources of technical and tutorial assistance.

Experienced faculty, however, enacted multiple roles—social, managerial, and pedagogical—to engage students and increase student persistence and success. In the social role, experienced instructors welcomed students to the class, encouraged them to share photos and experiences, and acknowledged the myriad pressures that might impact their class performance. Previous studies point to the importance of online instructors as facilitators/moderators (Addesso, 2000; Berge, 1995; Bischoff, 2000; Knowlton, 2000).

Experienced instructors primarily enacted a pedagogical role, giving course-related feedback, asking questions, and engaging students with the content. Students in courses with experienced faculty were more active in discussions and averaged a greater number of discussion postings online than students in the courses of novice instructors. Previous studies suggest that discussion is important in online courses (Astleitner, 2002; Berge & Muilenburg, 2000).

Best practices from this study include encouraging faculty to enact the appropriate role(s) needed at various points in the course. When faculty are present ("visible" and active) in the online environment, students benefit and student participation increases.

SUMMARY

Much can be learned by observing the practices and behaviors of students and faculty in online courses and by getting interpretations of faculty behavior and

the online environment from students. Based on our studies, we surmised that some students find the online environment confusing and they drop courses due to this confusion and their belief that they cannot affect a positive outcome. Secondly, from observing faculty online and from interviews of what faculty do online, some faculty are equally confused by what it means to teach online, giving little feedback, rarely being present, and allowing the students largely to fend for themselves. In a highly structured course, students who are self-motivated and academically talented make it through with less than ideal pedagogical conditions. For other students, dropout and failure is the more likely outcome.

In summary, faculty members who are new to the online environment would benefit from being paired with an effective online instructor for an initial course. In this way, the novice faculty member can observe the technological, managerial, social, and pedagogical roles of faculty and how and when to engage those roles online. Secondly, students need active faculty involvement early in the course in order to understand the course layout, assignments, and expectations. Identifying weaker students through pre-assessment and other less assertive students may help faculty identify students who will need individual assistance early on. Students in this environment will benefit from the faculty practice of multiple instructions, multiple times, in multiple ways. The absence of support and clarity that students feel in the face-to-face environment can be overcome by increased clarity and repetition in the asynchronous environment. Students not only need to be graded in the online environment, student behavior online should be monitored. Instructors should monitor student activity using the tools available through course management systems. Faculty can ask who is online? when? doing what? how often? The answers to these questions can serve as early indicators for who may persist and succeed and who may dropout from the online courses.

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