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ABSTRACT

This study explores the question of access in Arizona's postsecondary electronic education environment by looking at an urban community college with a highly diverse student population. Phoenix College (PC) is a community college in the Maricopa Community College District in Phoenix, Arizona. A number of neighborhoods near the campus showed a household income of 50-75% below the poverty level. Ethnic minorities represented 57% of the student body at Phoenix College. The college is early in its Web course development, and offered only 16 Web courses in the spring term of 2001. Courses required by or that applied to a large cross-section of academic and occupational degree and certificate programs were selected for the study in order to obtain a broad representation of majors and educational goals among the student sample. The study looked at 10 sections of freshman-level general education courses. The sample included 252 students--140 returned an electronic survey, and 100 participated in the follow-up interviews. Women represented 56% of the PC student body, but 65% of the Web students were women. Older students were underrepresented in the Web courses under study: 6% of these students were aged 40 or older, while 19% of students at PC were over 40. The study also found that the majority of Web students were White, and there were proportionally fewer Hispanics registered in the Web courses. (Contains 32 references.) (NB)

Access and Success in Web Courses at an Urban Multicultural Community College: The Student's Perspective

Patricia L. Moore

Access and Success in Web Courses at an Urban Multicultural Community College: The Student's Perspective

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The growing emphasis on electronic delivery of education in Arizona has occurred as the state's population demographics are rapidly changing. New resources in the state are being targeted at the development of online education. This study was conducted at one of Arizona's most culturally diverse urban campuses, in the early stages of its web course development. From a sample of 252 students enrolled in ten web sections, the study explored relationships between student demographics and success in web courses, student reasons for enrolling in web courses, perceived barriers to success, experiences in web versus traditional courses, suggestions for improving the web course experience, and intention to enroll in web courses in the future. Web student attrition rates were found to be twice as high as college-wide attrition. Student interviews suggested that insufficient technology experience contributed most to attrition, followed by learner characteristics, such as self-motivation, tendency to procrastinate, and discomfort with independent learning. Success rates also differed cross courses, with Psychology student success two to three times higher than success rates in English sections.

Background

Because higher education is closely related to life chances and economic prosperity in America, the issue of who can access advanced educational programs has been controversial. Access was originally thought of as the ability to gain entrance to an institution or program. The concept gradually shifted from one of equity in admissions to equity in outcomes, or the ability of a student or group of students to succeed once admitted. This study looked at web course access from both perspectives.

Historically, lower socioeconomic groups, ethnic minorities, and women have struggled for access. The under-representation of ethnic minorities in higher education is well documented in the literature. (Coombs, 1985; Baker & Velez, 1996; Spring, 1996). Chicano students have been found to be significantly under-represented in colleges of the Southwest, relative to both White and Black students (Garcia, 1980). Further, the significantly higher attrition rates in two-year institutions disproportionately affect minorities (Nora, 1987).

In recent years, access issues have broadened to include working students, single parents, and others defined under the broad category of "place-bound and time constrained learners" (Matthews, 1999). Distance-learning modalities have been developed, in part, to help address some of the needs of these populations, from the early correspondence courses of the mid-1800s to the cutting-edge web technologies we see today (Baer, 1998). As scarce resources in higher education have begun to be funneled toward development of Internet-based learning, the issue of access is again being raised.

Foundational studies on student access and outcomes in the 1970s and 1980s focused on full time residential college students at four-year institutions (Bean, 1987; Spady, 1971, Tinto, 1975). As higher education diversified and more community college

and non-traditional students became an important segment of postsecondary education, outcome studies broadened as well. While campus-based research focused on persistence to graduation, later studies, particularly in distance education, began to focus on a smaller unit of measure, within-course persistence (Bernard and Amundsen, 1989).

Studies of within-course outcomes in distance-delivered courses have identified a number of factors that can affect student success. Powell, Conway, and Ross (1990) identified environmental and dispositional factors, including a specific place to study, strong time-management and organizational skills, and a preference for independent learning. Wilkinson and Sherman (1990) cited environmental conditions such as noise distractions, disorganization and unmanageable workloads as faculty-identified factors that contribute to procrastination and student failure in distance learning programs. Terrell and Dringus (2000) showed a link between student learning styles and higher dropout rates in an online master's degree program.

In Arizona, there has been a growing emphasis on electronic delivery of education. A considerable proportion of the new resources for education in the state are being targeted at distance education, and particularly the development of online education and e-learning initiatives. The governing board of the State's university system recently launched a "virtual university" which promised "increased access to public university courses" (*Arizona virtual university launched*, 2000, p.1). Since it is believed that web courses can be an effective means of expanding access to students in Arizona, the object of this study was to determine who is accessing these courses, as well as who is succeeding in them. In addition, qualitative data was collected to better understand the web course experience from the students' perspective.

Research Methods

The Setting

This study attempted to explore the question of access in Arizona's postsecondary electronic education environment by looking at an urban community college with a highly diverse student population. The campus selected for the study was Phoenix College. Founded in 1920, Phoenix College is the oldest of the colleges in the Maricopa Community College District in Phoenix, Arizona. A two-year public institution, the College has a service area with a six-mile radius in the heart of urban Phoenix and is designated a Hispanic Serving Institution (Benitez, 1998, Raines, 1998). A number of neighborhoods nearest the campus show a household rate of 50%-75% below the poverty level. In the areas closest to the college, Hispanics make up the largest minority group and over 57% of the student body at Phoenix College are ethnic minorities (Phoenix College, 2000, pp. 18-19).

Phoenix College is early in its web course development. The institution first offered a small selection of web courses in the mid-1990s, and the first faculty members were trained and began using the WebCT platform in 1998. In Spring 2001, the semester in which the study was conducted, P.C. offered only 16 courses on the web, with a total of 24 sections. By comparison, Rio Salado College, a sister college in the Maricopa system that specializes in distance education, offered over 200 courses on the web.

The Sample

In order to obtain a broad representation of majors and educational goals among the student sample, courses were selected which were required by, or would apply to, a large cross-section of academic and occupational certificate and degree programs. A total of 10 sections taught by five full time faculty members were included. The courses were freshman-level general education courses, including all web sections of English 101, English 102, and Psychology 101. The sample included 252 students enrolled in the 10 sections. 140 students returned an electronic survey, and 100 students participated in follow-up interviews. Finally, outcomes for all 252 students in the courses were obtained from the college Registrar and analyzed.

Students were included in the study if they were enrolled any time between the 1st and the 45th day of the semester, regardless of whether they ultimately completed the course or not. Comparisons were drawn, where possible, between the demographic characteristics of the web students and the student body as a whole.

The Design

This was a descriptive study with a multi-method design utilizing both qualitative and quantitative data. An electronic survey adapted from an existing web survey used at Northern Arizona University gathered demographic data and probed student reasons for enrolling in a web course. Variables of interest included gender, age, ethnic background, and employment status. Interview protocols were developed to explore student experiences in web courses, including barriers to success they encountered, factors that course completers attributed to their success, how students' experience in web courses compared to traditional courses, their recommendations for improving the web course experience, and their plans to take web courses in the future.

Summary descriptive statistics were employed to analyze the results of both student demographics and outcomes. Analysis of the qualitative data included coding of the data, then categorizing responses into emergent themes and patterns as suggested by Miles and Huberman (1984), and summarizing and reporting the responses in matrix tables.

Findings

Who accesses web courses?

Males and Females in Web Courses

Although traditionally underrepresented in higher education, women have made great strides in recent decades, and now outnumber men by roughly 51% to 49% at the baccalaureate level (Brownstein, 2000). Early studies of Internet use by women also suggested that there was a "technology gap" between the genders, but most recent data suggests that women have closed this distance as well, at least in this country. Data drawn in May 2001, indicated the gender breakdown for at-home Internet users was 51.7% women and 48.3% men (CyberAtlas, 2001).

This "reverse" gender trend was evident in the web courses under study at Phoenix College. Women enrolled in the web courses at a higher rate than men, and that rate was proportionally greater than the percent of females at the college. While men represented 37.8% of the student body at Phoenix College, only 33.7% of web students were men. Women represented 55.8% of the P.C. student body, but 65.1% of the web students were women. However, 6.4% of students at the college did not declare their gender. If that information were known and if those students were largely female, the percentage of men to women in web courses might closely parallel the percentages in the student body as a whole.

Age Demographics of Web Students

There also appears to be a technology gap for older Americans. Recent data indicates that only 5.3% of men over the age of 55 and 4.7% of women 55 and older have access to the Internet (CyberAtlas, 2001). Ipsaro (1997) identified the aging workforce and the need to be re-skilled as an important continuing need in education. Because most older students are also employed full time, access to the Internet for continuing education may be the only feasible alternative for older students (Brown and Duguid, 1996; Threlkeld and Brozska, 1994).

Older students were underrepresented in the web courses under study. Results showed that younger students at the college were attracted to web courses in much greater numbers than older students. While 58.8% of the student body is under the age of 30, 78.2% of web students in the study are under that age. Only 6.3% of web students are 40 years or older, while 19.3% of the students at Phoenix College identify themselves as being 40 years or older. One way to account for this may be the type of courses studied. Older students often have reasons for continuing their education that would preclude the necessity for general knowledge courses such as English and Psychology. Rather than pursue academic degrees, older students may be taking courses for specific skills or leisure interest, or they may have completed these freshman-level courses previously. However, we can conclude from the sample that traditional-age students--24 and younger--are enrolling in web courses in greater numbers than older students, and in greater proportion than their age categories at the college.

Ethnic Background of Web Students

The ethnic mix of students in the web sections differed from the college profile in several respects. The proportion of American Indian/Alaskan Native students in web courses mirrored that of the college population at 4.0%. Asian or Pacific Islanders were slightly under-represented, proportionately 2.9% of the student body but only 2.4% of web students. Black students were somewhat over-represented, comprising 8.7% of the web student population as compared to 6.8% of Black students at the college. There were proportionately fewer Hispanic students (17.8%) registered in web courses than the known percentage of Hispanic students at the college (27.2%). White (non-Hispanic) students represented the majority of web registrations (59.1%) while they make up only 40.3% of the student body of Phoenix College.

In looking at the primary ethnic background of students at Phoenix College, available data is somewhat inexact. The college has the largest number of students within the Maricopa system who label themselves as "other" (18.8%). In a Title V federal grant application college officials state:

> Anecdotal information suggests that many of the students who fill out forms claiming they are "other" are actually Hispanic but fear that they may call attention from the Immigration and Naturalization Services to themselves if they designate themselves as Hispanic...A significant number of students move back and forth between the U.S. and Mexico each semester, and it is estimated that many of these students do so as "undocumented" U.S. residents (Phoenix College, 2000, p. 9).

Thus the percent of Hispanic students at Phoenix College may in fact be significantly higher than 27% of the student body. The under-representation of Hispanic students in web courses may be an even more serious problem than official data suggests, if the large percentage of students categorized as "other" also includes a substantial number of Hispanic students. Figure 1 presents a summary of expanded or constricted access to selected web courses at Phoenix College, when "access" is defined as the ability to enroll in the course.

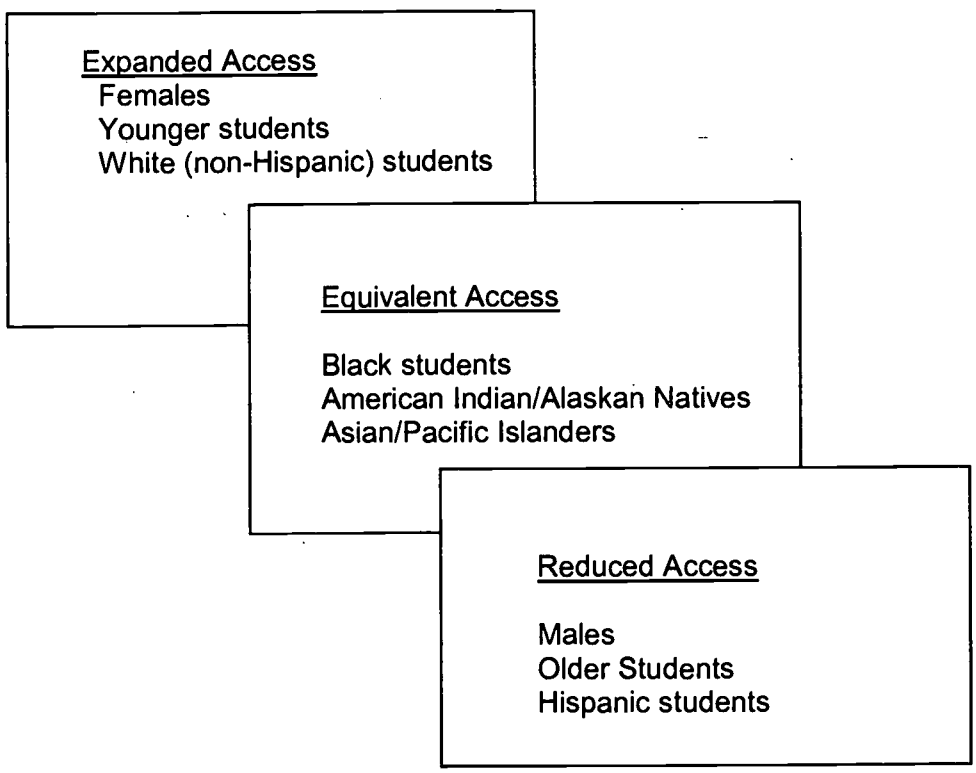

Figure 1. **Summary of access to selected web courses at Phoenix College**

Employment Status of Web Students

The majority of students taking web courses in the study were employed. Only 8% of the students indicated they were not employed, about 30% worked less than 30 hours per week, and 44% were in the "31 or more hours per week" category. During interviews and in response to open ended questions on the electronic survey, many students indicated they worked 40, 50, or 60 hours or more, and a number of them held more than one job. Employment information was not reported by 46 of the students in the study (17.8%) but it is reasonable to assume that many of them were employed.

Who is succeeding in web courses?

Success in this study was defined as a final grade of A, B, or C. Non-success was defined as a final grade of D, F, I (incomplete), or W indicating that the student had withdrawn from the course. Although in some institutions a grade of D is considered a passing grade, in Arizona a D does not transfer between community colleges and universities, although it does transfer between the colleges in the Maricopa system. Phoenix College does not include a D in its definition of passing grades and thus a grade of D was not considered a successful completion of a web course in this study.

Success rates were analyzed and reported in several ways. As stated previously, the sample consisted of 252 students. For purposes of institutional research, Phoenix College computes completion rates based on enrollments (one grade for each student in each class), but includes only student enrollments after the allowable drop/add period during the first week of the semester. In keeping with this standard and for comparison purposes, success rates reported in Table 1 were calculated for only the 238 web student enrollments remaining after the end of the first week.

In broad terms, the success rates of web students in the sample were considerably lower than the college rates overall. Calculated from the start of the second week after the allowable drop/add period, 39.5% of web students in the sample completed their courses with a passing grade, compared to a success rate of 72.5% for the student body overall.

By far the largest attrition was due to students withdrawing from web courses, not failing them. Of the 238 students still enrolled after the allowable drop/add period, more than half eventually withdrew, a withdrawal rate nearly three times higher than the college overall. This finding is consistent with a previous study done in the Maricopa District at Rio Salado College (Mills, 1999) that found higher non-completion rates for distance learners than for non-distance learners.

Table 1. **Comparison of Outcome Percent and Frequency of Web Students and Entire College**

Outcome	Web course enrollments after drop/add N=238	Phoenix College enrollments after drop/add N=28,909
A – passing grade	26.0% (62)	37.5% (10,850)
B – passing grade	7.9% (19)	19.9% (5,752)
C – passing grade	5.5% (13)	11.2% (3,232)
D – not passing	1.7% (4)	2.9% (844)
F – not passing	3.7% (8)	4.6% (1,325)
I – incomplete, not passing	1.3% (3)	.04% (12)
W – withdrawal	54.2% (129)	19.5% (5,510)

Success by Gender, Age and Ethnicity

Success rates by gender, age, and ethnicity were calculated for all students who were registered any time between the first and the forty-fifth day of the semester. Those web students who took two courses were considered successful if they passed either one. Cases with missing data in which gender, age, or ethnic background were not known were excluded. Table 2 summarizes the success rates by demographic categories.

Table 2. **Success Rates by Demographic Variable**

Demographic	Successful outcome: A, B, or C	Non-successful outcome: D, F, I, or W	Total
Gender			
Male	27.1% (23)	72.9% (62)	100% (85)
Female	39.0% (64)	61.0% (100)	100% (164)
Age Category			
15-19	27.9% (19)	72.1% (49)	100% (68)
20-24	33.7% (30)	66.3% (59)	100% (89)
25-29	37.5% (15)	62.5% (25)	100% (40)
30-39	48.7% (19)	51.3% (20)	100% (39)
40-49	41.7% (5)	58.3% (7)	100% (12)
50-59	25.0% (1)	75.0% (3)	100% (4)
Ethnic background			
White	43.3% (65)	56.6% (85)	100% (150)
Hispanic	31.1% (14)	68.9% (31)	100% (45)
Black	4.5% (1)	95.5% 21)	100% (22)
Native American	20.0% (2)	80.0% (8)	100% (10)
Asian/Pacific Islander	66.7% (4)	33.3% (2)	100% (6)

Not only did women enroll at higher rates, but they also surpassed men in success in their web courses. 39.0% of the women registered on the first day of class passed with an A, B, or C, while only 27.1% of the men did so. One can conclude that from either an enrollment or outcome perspective, there is constricted access for men.

Although a higher proportion of young students enrolled in web courses, success rates indicated that these same students did not succeed in the courses at proportional rates. Of students age 24 or younger who were enrolled on the first day of the semester, 31.2% passed their web courses, while 42.1% of students 25 or over passed them. While younger students (15 to 24) were attracted to web courses and actually comprised 62.3% of the sample, just under one-third of them succeeded.

When analyzed by ethnic background, the question of success was also mixed. Black students enrolled in web courses at a rate exceeding their representation at Phoenix College, but were the least successful in web courses, with only one student successfully completing out of 22 originally enrolled, a rate of 4.5%. White students in the sample passed at a rate of 42.9%, Hispanics at a 31.8% rate, Native American students at 20.0%, while the six Asian students enrolled succeeded at 66.6%. The small number of Asian students (6) and Native Americans (10) in the sample make it difficult to draw conclusions about their success rates.

Success and Employment Status

Although the web courses in the sample were accessible to students who were employed (73.8% worked at least part time), there was no clear association between employment status and success. Student work schedules were cited frequently as a reason for choosing a web course. Some studies have suggested that heavy work schedules were an environmental barrier to success in distance courses (Wilkinson and Sherman, 1990) but this study did not find evidence to support that. Of the 130 barriers to success identified by students in interviews, only one student specifically mentioned a heavy work schedule as a partial reason for early withdrawal, although some did cite other types of busy schedules (sports or academics, for example) as barriers to success.

Course Differences in Success Rates

Bernard and Admundsen (1989) argued that issues specific to the design of a course, such as structure, delivery, content, level of difficulty, and intended learning outcomes could have as much influence on persistence as student background characteristics or attitudes. At Phoenix College, Psychology students were more successful than students in either English class (56.3% of Psychology students registered from the first day succeeded). English 101 students were more successful (at 32.47%) than English 102 students (18.18%).

In order to better assess the significance of success rates in the specified courses, final rosters for students in all face-to-face sections of English 101, 102, and Psychology 101 were obtained from Phoenix College. Because there were a large number of these face-to-face sections on campus (91 in all), five sections of ENG 101, five sections of PSY 101, and seven sections of ENG 102 were randomly selected and analyzed for success rates. As mentioned previously, success rates were computed after drop/add,

which is the method used by Phoenix College for measuring success rates, rather than measuring on enrollments from the first day of class. This produced slightly higher success percentages for the web courses than those reported above. Figure 2 summarizes the comparison of success between web and face-to-face course formats.

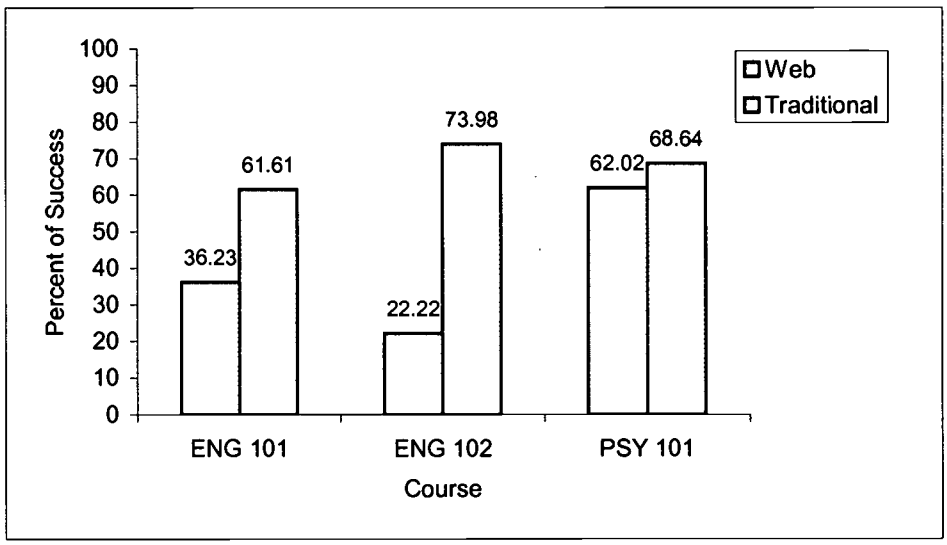

Figure 2. **Percent of success for web and traditional samples after drop/add**

While this study was not designed to determine the cause of the differences across courses, a number of explanations come to mind. Level of difficulty is certainly a possibility, especially as an explanation for the two English courses. It should also be noted that Psychology is generally taken by students as an elective, while the two English courses are a requirement for virtually every student at Phoenix College. That students may choose to take Psychology but are required to take English might affect their performance. The type of study may also be an issue. Reading content and responding to it on tests may be a very different experience from having to do research or produce a lengthy paper.

Experiences of Students in Web Courses

The study was interested in why students enroll in web courses, and how their web course experiences differ from traditional courses. Data were gathered both from the electronic survey, and from follow-up interviews conducted throughout the semester with both persisting and withdrawing students.

Reasons for Enrolling in Web Courses

In order of frequency, students cited time flexibility as the most important reason for choosing a web course (102 responses), followed by flexibility of location (55), and a

preference for web courses as a method of learning (38). Students cited 16 various other reasons that were grouped into a "miscellaneous" category.

The need for flexible time was most related to students' work schedules (60 students specifically cited work) and the need for flexible location was most commonly linked with childcare and family obligations (cited 29 times). The 38 students who preferred the web as a method of learning were attracted to the aspects of self-pacing, the innovation of learning in a new way, and the privacy afforded by at-home learning. Sixteen students cited miscellaneous other reasons.

The interviews and survey results suggested that Phoenix College students are largely choosing web courses by design, not by accident, or as "placeholders" in their academic schedule while they search for better options. Of the 209 separate reasons cited for choosing to enroll in a web course rather than a face-to-face section, only seven stated they were forced into a web section because traditional sections were closed or their schedule could not accommodate them. Four students cited physical constraints as necessitating their web course, and one indicated safety concerns about taking a traditional course at night in Central Phoenix. It is interesting to note that the drop rate during the first week of class for Phoenix College overall was 25.84%, while for web students it was only 13.13%, suggesting there is less "shopping" for classes among web students than among students overall. It is possible to conclude from this that web courses represent a viable and desired option in the minds of students, not just a forced alternative when all else fails. It could also be argued that web courses, though not the student's most desired option, represents their only viable alternative given the constraints of their work schedule, home life, or other factors.

Barriers to Success

There were 130 individual responses to the question of barriers to success in web courses. Some students said they didn't experience any barriers in their courses. Others identified barriers that were unrelated to the fact that the course was a web course, such as a death in the family, a change in job status or requirements, or a financial aid problem. All barriers that were cited were coded and sorted into categories. When students indicated more than one barrier, each was recorded and coded separately. Table 3 summarizes the frequency of responses by category.

Table 3. **Categories and Frequency of Student-Perceived Barriers to Success**

Response Category	Frequency
Experiential Barriers	35
Lack of computer experience –19	
Confused by web site – 12	
Needed better technical support – 4	
Dispositional Barriers	23
Dependent, collaborative learning style – 16	
Student self-regulation – 7	
Academic Barriers	16
Technical Barriers	10
Computer malfunction – 8	
Internet or server access – 2	
Environmental Barriers	8
Problems getting access to computer – 5	
Distractions in the environment – 3	
Unrelated Barriers	23
Personal – 10	
Financial – 7	
Other – 6	
No Barriers	15

As Carvin (2000) and Nasseh (1999) anticipated, computer literacy proved to be the students' greatest concern. Of the 92 responses, 35 (38.%) discussed barriers and problems that were related to their lack of computer experience. Some students reflected on the fact that their estimation of their own computer literacy had changed over time.

> I had a hard time downloading things. When the teacher sends me something back and I have to download it, then I can't find it. It kicks me out and I have to sign back in. Once I read my email, I can never find it again. Even my husband, who is really computer literate, has had trouble helping me find things. I thought I knew pretty much about computers, but I'm finding I really don't.

Students identified dispositional barriers, (barriers related to their own self-regulatory skills, or learning style preferences) as the second most common problem, supporting Reid's (1997) identification of two skills critical to online learning: strong time management skills, and the ability to be responsible for self-learning. Twenty-three responses (25%) identified the students' own lack of self-discipline and time management skills. Asked what was the greatest barrier to success, one student described his biggest problem:

> Disciplining myself to do the work. The due dates were the hardest thing—I never really liked English and I couldn't force myself to do the assignments by the due dates. I was so busy I forgot to go over and pay for two classes, so when I was dropped from them, I tried to get in touch with the instructor to get back in, but never heard back from her so I decided just to let it go. I'm also taking Fire Science 106 on the web, but there are only two due dates—mid term and final, so I think I can keep up with that one.

Others identified a need for closer contact with the teacher or other students. As one student noted:

> I really didn't like it. I haven't had English in so long, I needed to be in the class to have day-to-day contact with the instructor. I need to have my questions answered immediately, not get a delayed answer by e-mail.

Another added:

> The biggest problem was not having interaction with other people. I ran into some roadblocks, and didn't have anyone to ask about it. Like some of the reference materials and links to other sites—I didn't really know what I was looking for.

Interviews with students didn't identify any clear trends common to students of similar ethnic backgrounds. Of the twenty-two Black students in the study, twelve participated in follow-up interviews. When asked about the barriers they experienced, four talked about their computer inexperience and being confused by the web course platform. Two said they had financial aid problems, two had personal family problems that prompted them to drop the course, two said they missed the interaction with other students, and one said her computer crashed so she had to drop the course. The final student, who was the only Black student to complete her courses (she was registered for two and succeeded in both) indicated a high level of frustration with the technical support provided for the course, and she was one of only two who said they would definitely not take a web course in the future

Of the twenty Hispanic students interviewed, six said a lack of experience caused them problems, four had personal problems unrelated to the course and had to drop, two missed the interaction in face-to-face courses, two did not like the course content, one felt there was inadequate technical support, one's computer crashed, and four said they did not experience any barriers at all.

Despite barriers, many of the students weren't discouraged. Eight Black students said they would definitely take another web course, and two said they might do so. Only two said they definitely would not. Fourteen Hispanic students said that they would take a web course in the future, as compared to six who said they would not.

Completing Students' Success Factors

Thirty-five students who succeeded in one or more web courses were interviewed, and asked what factor(s) helped them succeed. Some students indicated more than one success factor, and each separate factor was counted and sorted into categories. Students most frequently cited the convenience and flexibility of the web delivery format as contributing to their success, followed by course design and personal motivation to succeed. Responses are summarized in Table 4.

Table 4. **Success factors identified by students completing their web course(s).**

Success factors	Frequency	Response examples
Convenience and flexibility Time - 7 Place - 7 Pace - 5	19	I'm really busy. I don't have time to go to campus. When I'm off work, I can work on the course whenever I can fit it in. I like that you can work at your own pace. I can do several assignments at once, or one at a time. Today I did two tests, because I'm a little behind. I liked that you could do it from other computers, like my computer at work.
Course structure or design	10	The way the course was structured was helpful, in that there were assignments with due dates leading up to the big assignments, and it made me do the work. When I got to the point of writing the paper, I was ready to do it, because of the steps along the way.
Self-regulation motivation - 5 time management – 1 help seeking – 1 computer expertise - 1 independent learner - 1	9	My own determination. Once I sign up for a course, I won't drop it and waste my money. I studied. That made me successful in the course. Time management. You can't be a person who does things at the last minute. You have to know your own pace. I am able to learn by myself.
Instructor contact	3	The quick response time from the teacher. When I had a question, she responded by e-mail the next day.
Textbook	2	Being able to read the book. You really had to rely on the book to pass the multiple-choice tests, and because you don't have a teacher there! I really learned a lot from the book--I haven't really read textbooks in the past.
None	2	I can't think of any. I wouldn't recommend it unless you are really motivated. I thought it would be easier...I would have been better off finding the time to go to school on campus.

Comparison of Web and Face-to-Face Experiences

Students were asked to compare their experiences in web courses with experiences in face-to-face courses. There was a considerable amount of consensus among the students of the type of learning style best suited to each modality, and the type of experience students can expect, summarized in Table 5.

Table 5. **Comparison of Web Courses to Face-to-Face Courses**

Web Courses	Face-to-Face Courses
Type of student with best chance for success in a web environment • Prefers fast pace • Prefers to work independently • Can manage a heavy reading load • Computer literate • Internally motivated; accepts responsibility for own learning • Organized and able to meet deadlines • Values convenience and flexibility because of busy schedule	Type of student more successful in face-to-face environment • Desires close and immediate interaction with the teacher and fellow students • Desires structure and accountability, such as mandated class times and assignment deadlines • Enjoys group discussion and networking with classmates • Likes to ask questions and get immediate answers • Is a more "hands-on" learner
Type of experience • Work in isolation • Less interaction/slower interaction with teacher (vs.) • More one-on-one attention from teacher • More privacy • Less competition and distraction from other students • Faster pace, not slowed down by other students • More immediate knowledge of progress and grades • Not as much work as a traditional class • Requires concentration	Type of experience • More passionate, a richer experience • More personal • Provides more insight and understanding • More ability to explain yourself and "get your point across" • More attention from teacher • Easier to learn and you learn a little more • More risk of embarrassment in front of the class
Type of course • Best for courses in which student has a strong background, feels confident he/she can master the material independently	Type of course • Prefer traditional courses if there is a need for complex explanations or demonstrations of class material • More suited to courses in which a lot of discussion is important to the learning

Students were divided on the issue of instructor contact in a web course. Some felt that they had less direct contact with their instructor in a web course, and that the interaction was slower, and they had to wait a day or longer for answers to questions. Other students felt that they got more one-to-one attention from an instructor in a web course than they normally did in traditional courses.

Student opinions reflected in the composite "profile" of web and traditional students and courses were in agreement with the conclusions of many researchers that student characteristics and/or learning styles were an important component of success in

distance learning (Dille and Mezack, 1991; Terrell and Dringus, 2000; Wilkinson and Sherman, 1990).

Student Recommendations

Both early withdrawers and persisters were asked for their recommendations for improving web courses. Student recommendations are summarized in Table 6.

Table 6. **Summary of Student Recommendations for Improvement of Web Courses**

Category and Frequency	Frequency Subtotals
Better communication	30
Student/teacher	
• Hold orientations earlier, before the semester starts, possibly several times, and make them mandatory - 9	
• Encourage/improve opportunities for phone contact with instructors - 6	
• Create opportunities for more face-to-face contact with instructors - 5	
• Instructors reply more quickly to e-mails - 2	
• Hire an assistant for each instructor to facilitate and manage communication, and get answers for the class - 1	
• Impress upon students how much time it takes to succeed in a web course - 1	
• Teach students the importance of saving files, and how to find them later - 1	
Student/student	
• Improve and promote the use of chat rooms - 3	
• Hold group meetings so students can meet and exchange phone numbers - 1	
Improve the web site and its technical support	25
• Technical support provide quicker responses; extend hours for the help line - 6	
• Explain WebCT better, have a directions page online, or instruction manual at the bookstore, and an FAQ (frequently asked questions) link - 6	
• Make submitting assignments easier, simpler, clearer - 5	
• Do research on the latest in online courses and update WebCT; make it more in line with current world wide web standards, and more accessible from various locations - 4	
• Create security measures that prevent cheating - 2	
• Create an instant reply feature so that when students submit an assignment they know if it was received - 1	
Improve course design/implementation	10
• Give more detail on assignment expectations and due dates - 4	
• Update course calendar more frequently and make sure it is correct - 2	
• Make quizzes and tests less frequent - 1	
• Create more links to enrichment materials - 1	
• Make sure the correct syllabus is posted on the first day of class or before - 1	
• Offer shorter, 1 or 2 credit, open-entry/open-exit courses - 1	

The number one recommendation was for better communication between student and instructor, and among the students themselves. Face-to-face or telephone contact

with the instructor was recommended, along with group meetings and orientations. Other recommendations focused on the technical aspects of the course, including technical support and simplified instructions to make the navigation of the course easier. Finally, students made recommendation about the design of the courses themselves. Fourteen students indicated that the courses needed no improvement whatsoever. Other students did not recommend specific course improvements, but were so positive about their web experiences that their only recommendation was for Phoenix College to expand its web course offerings.

Future Plans

A majority of students interviewed indicated a willingness to try web courses again in the future. These interviews included students who persisted in the course as well as those who withdrew early or never logged on. Of the 100 students interviewed, 99 indicated what their future plans would be. Sixty-three students (63.6% overall) said "yes" or "probably" they would try another web course in the future. Thirty-six said "no" or "probably not" to a future web course. Figure 3 summarized the responses of students by persistence category.

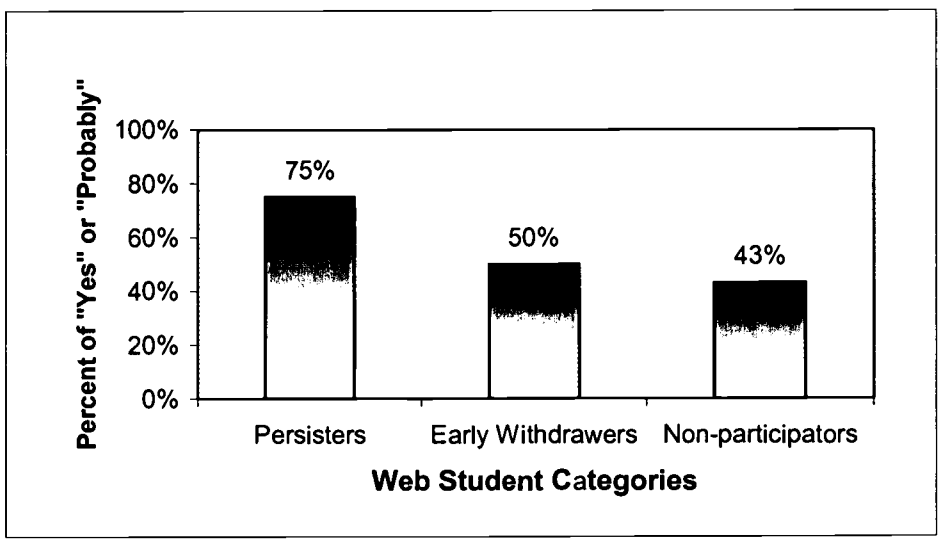

Figure 3. **Affirmative answer percent by persistence category: intent to take web courses in the future.**

Summary of Findings

Web courses at Phoenix College can be viewed from two access perspectives: one of enrollment, the other of success. In terms of enrollment, women are particularly benefiting from the web. Twenty-nine women indicated that they had chosen a web course because of single-parenthood or other child-care concerns. The courses are also attracting young students, working students, and students of all ethnic backgrounds except Hispanic at rates comparable to or exceeding the college student profile.

Enrollment rates of men, older students, and Hispanic students are not proportional to the college population.

From the perspective of success in web courses, the overall rates of success are well below the college as a whole. Of particular concern is the success of males, of young students below the age of 25, and of Black students. Barriers to success most frequently cited by students were related to insufficient computer background, as well as to student self-regulatory behaviors and learning style preferences.

Students are taking web courses because they are busy. Work schedules, family obligations, and heavy academic loads were among the most frequently cited reasons for enrolling in web courses. The picture of a satisfied web student that emerged from the qualitative data was one who is seeking a fast-paced course, who enjoys working independently and is well organized, and who values convenience and flexibility because of a busy schedule. Students recommended face-to-face courses for learners who desire close and immediate interaction with the instructor and their fellow students, for hands-on learners who enjoy the richness of group discussion and discovery, and for those courses which students find extremely difficult or for which they do not have sufficient background.

Discussion

The fact that web course success rates are far below the college average for all groups has serious implications for the institution and for the hope in Arizona that web courses will expand access to higher education. While web courses may offer access to place-bound and time-constrained learners of every ethnic background, it is still unclear whether these students will be able to succeed in the web environment. A complex network of factors can work against student success in web courses: a lack of experience with computers and technology, a sense of isolation from instructor and other students, poor time management skills, confusion with the web site and lack of technical support, distractions in the environment, and the pressures of a very busy schedule.

For some students, web courses seem almost like a classic approach/avoidance conflict. They are strongly attracted to the convenience and flexibility, but find that the time saved in travel and "seat time" in class can be lost to confusion, having to learn new systems, and having to wait for answers to questions. As one frustrated student who dropped the course described it:

> It was difficult to get on the site. There were not clear instructions on how to log on and how to access the site. They send me a postcard the first week with instructions, and I followed them exactly, tried every night. Finally called them and they sent me another different set of instructions. They were right, and I got on, but couldn't download assignments. I could access the bulletin board, but not the chat room. It could have been a problem with my computer, I suppose, but it was just too frustrating. My time is too valuable to spend an hour trying to figure out the course.

Some students want to try web classes because they think they will be easier than face-to-face, and are unhappily surprised at the amount of work the courses take. As one student recommended,

> I don't really think they need much improvement. But I think they should emphasize to students how much time they need to devote to the web courses. You do have a big time commitment, and they should make sure students know that in advance.

The differential success rates among students of different ethnic backgrounds present more questions than answers. In follow up interviews, all the students sounded very much alike. The reasons that Blacks students withdrew were similar to the reasons that Hispanic or White students did, and no distinct themes could be identified by ethnicity. One notable difference was the variable success that students of different ethnic backgrounds had in the English and Psychology classes. The only successful Black student passed both her English and Psychology courses. Hispanics and Whites were very close in their success rates in Psychology (52.94% for Hispanics and 57.40% for Whites) but the Hispanic students had much more difficulty in their English classes than White students (17.14% compared to 33.64% respectively). This could be related to their language history, to cultural differences, or some other combination of variables not identified in this study. Given Phoenix College's designation as a Hispanic Serving Institution, as well as Arizona's changing demographics, the issue will definitely need more attention.

Self-motivation was a recurring theme in student interviews. One young lady between the ages of 20-24 who succeeded in her course painted a compelling picture of the opportunities that web courses offer to highly motivated students:

> I currently need to work full time to support myself, and I am planning my wedding this semester as well. Internet classes allow me the time I need to have my cake and eat it too. Without the internet classes I would not be able to continue my educational goals in the time frame I have chosen. I am able to maintain a full time academic schedule and enjoy the other aspects of my life. I have learned skills outside of the actual course material that will be invaluable later in life such as scheduling my time, meeting goals without constantly being reminded, self motivation, and my feelings toward procrastination have changed considerably. Putting off an internet class gets you absolutely nowhere!

Although highly motivated and independent learners were able to flourish in the web environment, most students still seemed to crave the interpersonal touch with both their instructors and their fellow students. Tinto (1975) theorized that social and academic integration affected persistence, and this theme of connections was in evidence at Phoenix College. Developing better, more immediate communication within web courses and with the institutional support services could have an immediate impact on persistence.

The high attrition rates found in this study are a concern, yet not necessarily unexpected in the early development of a new instructional medium. They certainly didn't seem to dull students' enthusiasm for more web education. The fact that students

of all ethnic backgrounds are enrolling in web courses is a hopeful sign, even if persistence rates are low. They tell us that the interest is there, and that students feel safe in experimenting in these new course options even if they don't at first succeed. With more research, experience, mentoring, and old-fashioned trial and error, the College will likely improve persistence rates in web courses.

Recommendations

In order to expand access and reach the underserved populations, particularly Hispanic students, the college administration should encourage the inclusion of web-based components in face-to-face courses across all disciplines to help introduce all students to the technology, not just those students who would naturally gravitate toward it. For web courses, appropriate advising and preparation to succeed in the electronic environment must also be available. Special training for academic advisors would allow them to better assist students in understanding the unique challenges of web courses and to help students assess their aptitude for them. Administration and faculty should consider whether any sort of testing (similar to placement tests for Math or English) or course prerequisite should be required as a gateway to web courses, to insure that students enter the electronic environment with the necessary skills to succeed.

In light of the high attrition rates, institution-wide assessment over multiple semesters should be initiated to better determine the strength and direction of retention trends in web courses, and identify causes and solutions for attrition. More detailed study of Hispanic students' success rates in English 101 and 102 should be undertaken to clarify whether the problems with English courses were related to the web delivery or the English subject matter, and appropriate student support could then be developed.

Given the large differences in success rates across courses, faculty should be involved in decisions about what courses are pedagogically appropriate for web delivery. Web courses should not become just another opportunity for entrepreneurial interests, but informed analysis should drive decisions on what types of courses are appropriate for web delivery. Institutional resources should be targeted to address course design problems unique to Internet education, and to fund collaboration with design specialists and cooperating institutions to obtain the necessary expertise to strengthen course design.

Since a sense of isolation and a need for immediate feedback were problems for a number of students, course designers can work toward enhanced student-to-instructor and student-to-student communication in web courses. Instructors may want to explore a system to hold "virtual office hours" in which they spend a certain amount of time in a chat room where students may go and get immediate answers to questions. Instructor-initiated phone calls to each registered student early in the semester could increase the student's sense of connection and proactively solve potential problems.

A student-to-student buddy system may help some students feel less isolated while taking web courses. In interviews, some students said that chat rooms were rarely used and thus ineffective as a source of support and recommended the College do more to promote student-to-student interaction in chat rooms or by some other method. An automatic reply feature to let students know immediately when assignments have been received by instructors was also recommended to help alleviate student anxiety about electronic submissions being lost.

A number of web students recommended that mandatory or optional orientations to web courses should be offered earlier in the semester, at multiple times and convenient locations and that technical support be made more available during off-business hours, with quicker response options be developed to assist students having technical problems.

Implications

Many proponents of distance learning and Internet education argue that new distance delivery methods will expand access to higher education.

> Distance education is first and foremost a movement that sought not so much to challenge or change the structure of higher learning, but to extend the traditional university and to overcome its inherent problems of scarcity and exclusivity... Distance education dealt with the problem of too many students in a single physical space. The university could, in effect, reach out, offering not seats, but the opportunity to learn (Matthews, 1999, p. 56).

Others anticipate a different kind of access problem in the future, in which traditional campus experiences become so expensive that students are left with web access as their only affordable alternative:

> The more expensive, conventional campus, with all its rich and respected resources, is less likely to disappear than to become the increasingly restricted preserve of those who can afford it. Net access will be for those who cannot...In consequence, despite conventional concerns about "have-nots" lacking access to technology, technology may in fact become the only access they have to experiences whose full value actually develops off-line (Brown and Duguid 1996, p. 12).

Yet demographic studies of access to the Internet and electronic technologies nation-wide continue to document a "digital divide" which persists across ethnic and socioeconomic lines (Carvin, 2000; National Telecommunications and Information Administration, 2000). The divide is not simply one of hardware and computer accessibility, although those are contributing factors. But as students in this study demonstrated, the divide is also related to computer literacy and independent learning skills. This study lends support to the contention that, whether defined as enrollment or success, access to web courses has not yet bridged that divide. If electronic education does indeed become the most—or only—affordable alternative for many students as Brown and Duguid suggest, then these attrition problems must be overcome.

Much work remains to be done if electronic education is to be a medium that can benefit all the diverse segments of the student population. Attention to course design and selection, adequate student advising and support, better communication mechanisms between student and instructor, and more intense research into the causes and remedies for high attrition are necessary to insure e-learning can truly fulfill it's potential for expanding access to higher education.

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