The Journal of Interactive Online Learning *Volume 2, Number 3, Winter 2004*
www.ncolr.org *ISSN: 1541-4914*

Student Traits and Attributes Contributing to Success in Online Courses: Evaluation of University Online Courses

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Abstract

The purpose of this study was to examine the roles self-efficacy, specifically technology self-efficacy and distance education self-efficacy, and self-regulation play in students' learning via distance education. This study examines a system for evaluating distance education courses in a similar manner to those for traditional university courses. Participants in this study were undergraduate and graduate university students enrolled in business distance education courses. Prior to the completion of the semester, students completed an online survey designed to measure technology self-efficacy, distance education self-efficacy, and self-regulation. Using a Likert-type scale, students rated the degree to which they agreed or disagreed with 53 statements that comprised the survey. Additionally, students responded to three short-answer prompts concerning the benefits and drawbacks of distance education. As indicated from this study's results, students judged that course evaluations used for traditionally taught courses can also be appropriate for distance education courses. Finally, self-efficacy and self-regulation levels were compared across gender, with no statistically significant gender differences resulting.

Educational technology has stretched educational boundaries and created new ones on a daily basis. One of these new and rapidly expanding boundaries is distance education. Distance education, some researchers and educators contend, is the new, student-centered paradigm for future learning (Miller, 1997; Yellen, 1998). So, what exactly is distance education? At its simplest, distance education is a form of education where the teacher and the students are separated by distance and/or time (Kearsley, 2000; Moore & Kearsley, 1996; Tiene & Ingram, 2001).

Though forms of distance education, such as correspondence courses using the mail system, have been around for more than 150 years, it is only within the last quarter century that distance education has really exploded. Modern technologies like video

teleconferencing, affordable personal computers, and the World Wide Web have given rise to this expansion. Many colleges and universities are at the forefront of this movement toward distance education. In the 1997–98 academic year about one third of the nations' 2-year and 4-year postsecondary education institutions offered distance education courses, and an additional one fifth of the institutions planned to offer distance education courses within the next the few years, (Lewis, Snow, Farris, & Levin, 1999). According the National Center for Education Statistics (NCES) report, *Distance Education at Degree-Granting Postsecondary Institutions: 2000–2001* (Waits & Lewis, 2003), 56% of all 2-year and 4-year institutions offered distance education courses at the beginning of the millennium. This represented an increase of 12% in institutions reporting offering distance education courses from the 1997–98 academic year and a 23% increase over the 1994–95 year. This meant that over 3 million students were enrolled in more than 127,000 distance education courses offered by these postsecondary institutions during 2000–01 (Waits & Lewis, 2003). This growth is predicted to continue without abatement. NCES (Waits & Lewis, 2003) predicts that of those postsecondary institutions that did not offer distance education courses, 12% of them planned to start offering them within the next 3 years. Draves (2002) believed that 50% of all learning (by educational institutions, business, and industry) by the year 2010 will be done at a distance.

One example of this phenomenon is the University of Phoenix. Through Phoenix Online, the university offers 25 programs online in 16 different fields. They currently have 7,000 instructors teaching over 49,000 students. Each week 8,000 students begin a new course. The University of Phoenix is enrolling an average of 200 international students a week. All of the classes are capped at 13 students and the typical class size is 11 (Olsen, 2002). It is now almost impossible to avoid educational technology at the collegiate level. Due to the demand, distance education is predicted to continue to grow exponentially for the foreseeable future (Phipps & Merisotis, 1999). On a broader scale, Draves (2002) predicts that by the close of the first decade of the 21st century, half of the learning that takes place in the world will take place online.

Students are attracted to distance education for a wide variety of reasons. Distance education provides some students with access to courses when they would not have been able to otherwise participate (Olsen, 2002; Phipps & Merisotis, 1999). Some of the other reasons for taking courses at a distance include restricted learner availability during scheduled course hours; more convenience in obtaining a degree or certificate; and greater means to advance one's knowledge in one's own areas of interest, whether or not a degree or certificate is involved (Charp, 2000).

Distance education can be divided into two broad categories: synchronous and asynchronous (King, Young, Drivere-Richmond, & Schrader, 2001). Video teleconferencing and chat typify synchronous distance education where the instructor and students meet at the same time, but are geographically separated. Web-based courses (online courses) are excellent examples of asynchronous distance education in which the instructor and the students are separated both by time and geography. Web-based courses have experienced the greatest growth, which some attribute to the cost incurred in an online course versus a video teleconferencing course (Draves, 2002).

The literature has shown that some of the benefits of asynchronous distance education are removal of time constraints for learning so students may proceed at their own pace of learning; minimization of forms of discrimination/bias sometimes

experienced in face-to-face classrooms (Shotsberger, 2000; Wegerif, 1998); removal of timed response demands because there is no need for an immediate response since the very nature of learner-centered, Web-based, asynchronous courses encourages reflection (Wegerif, 1998); and allowance for the interaction necessary for learners to control their own learning and become more self-reflective and self-constructive (Collison, Elbaum, Haavind, & Tinker, 2000; Parker, 1999). Draves (2002) lists ten reasons why online learning is more popular and, in his opinion, why it is better, cognitively, than in-person learning:

- You can learn at your own peak learning time of day.
- You can learn at your own speed.
- You can learn faster.
- You can interact more with the teacher and other participants.
- There are more topics and subjects online.
- Participants come from around the world.
- You can learn from the foremost authorities and experts.
- Online learning is less expensive and thus more accessible.
- Internet links provide more resources.
- You can form a virtual community.

Though Draves believes that online learning is superior, in some ways, to face-to-face learning, a question arises: How do the students feel about their online course experiences? As with any university course, distance education courses need to be evaluated. When evaluating a face-to-face classroom, teachers use a variety of techniques. Some of the informal techniques used by teachers are the posing of questions, listening carefully to student questions and comments, and monitoring body language and facial expressions. Informal, implicit evaluations permit the teacher to make adjustments in their teaching, to slow down or review material in response to questions, confusion, and misunderstandings, or to move forward when student performance meets or exceeds expectations. Instructors and educational institutions also evaluate courses formally through surveys and questionnaires normally distributed to students near the completion of the course, often providing student feedback on both the course and the instructor.

However, when teaching at a distance, educators must address a different teaching challenge than when teaching in a traditional classroom. It is clear that instructors cannot just take their notes and PowerPoint presentations, put them on the Web, and expect the online course to be a success (Moore & Kearsley, 1996, Palloff & Pratt, 2001). Knowlton and Weiss (2000) stated, "When faculty attempt to enhance their courses with technology but do not consider pedagogy, they are usually disappointed with the results" (p. 2). Instructors have to be taught the proper integration of technology and pedagogy to make distance education beneficial to the learner (Hara & Kling, 2000; Palloff & Pratt, 2001; Regalbuto, 2000).

The same challenges are true for students who evaluate the effectiveness of their course and instructor at the end of the semester. Difference between distance education and traditional education may result in new standards and criteria necessary for the appropriate evaluation of distance education courses and the instructors (Shuey, 2002; Willis, 1993).

Although course evaluations for distance education courses should encompass the same concepts as well-designed course evaluations for traditional courses, alterations and amendments are needed (Holcomb, 2002; Shuey, 2002; Willis, 1993). For example, Willis (1993) suggested that distance education courses should be evaluated according to such criteria as use of technology, quantity and quality of student interaction with instructors and classmates, class formats, and support services.

Purpose

The purpose for this study was two-fold. First we attempted to examine a system for evaluating Web-based courses in a similar manner to those for traditional university courses. Initially, we were concerned with whether students would continue to enroll in future asynchronously taught distance education courses. Second, we were interested in identifying variables, such as self-efficacy, gender, and academic level, that may be related to predicting success among students enrolled in Web-based university distance education courses.

The research questions guiding this study are

- Are course evaluations used for traditional courses appropriate for courses taught via distance education?
- Are there significant gender effects for technology self-efficacy, distance education self-efficacy, and self-regulation measures?
- Is there a difference in technology self-efficacy, distance education self-efficacy, and self-regulation measures based on previous distance education experience?
- Are there significant differences between undergraduate and graduate students on technology self-efficacy, distance education self-efficacy, and self-regulation measures?

Self-efficacy for asynchronous distance education was considered to be one critical component of whether a student would continue to take Web-based courses. Bandura (1997) provided a parsimonious definition of self-efficacy: "Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Many factors contribute to self-efficacy, but mastery experiences are the most influential sources of self-efficacy (Bandura, 1997). It is this belief in one's ability to successfully complete a task, not just a set of skills, which largely determine the success of an individual's endeavor. Self-efficacy is a proven predictor of academic achievement (Schunk, 1991). As in every academic endeavor that students attempt, their self-efficacy for that task is a very important component for successful achievement. Web-based distance education is a relatively new method of instruction, which few students have experienced. Therefore, it was predicted that success in one distance education course increase the probability in more students enrolling in future distance education courses (King, 2001).

Another component that contributes to students' success in asynchronous distance education is their ability to self-regulate. Self-regulation is "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p. 14). Zimmerman (1995) also described students as being

self-regulated learners to the "degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process" (p. 3). Therefore, both self-efficacy and self-regulation may be key components of academic success in distance education (King, 2001).

Previous research also supports the efficacy of distance education (Moore & Kearsley, 1996; Phipps & Merisotis, 1999) and the fact that online course students' mastery of material was equal, or superior, to traditional classrooms (Kearsley, 2000). Additionally, online courses cited in the above research demonstrated that, as individual participation increased, students' ability to deal with complex issues improved and subject matter interest increased. Further, these students reported improved access to professors, deeper educational experiences, and a higher satisfaction with courses.

Gender differences is a problem that has plagued education for numerous years. Research conducted in the early 1990s by the American Association of University Women Educational Foundation (AAUW) found that male students receive more attention and esteem building encouragement from teachers than female students. An additional study conducted by the AAUW (2000) also found that the methods of teaching most commonly used by teachers in the classroom appealed the most to males.

Gender gaps are also present in the area of technology. As technology continues to grow in use and importance, it has become evident that women are falling behind when it comes to technology. Most studies have found that the gap between male and female achievement and attitudes toward computers is small in the early grades, but males are at significantly higher achievement levels by high school (Shashaani, 1995). Discrepancies in both use and skills are very clear-cut between genders indicating males perform at a higher level and use computers with a higher frequency (Shashaani, 1995).

Procedures

Sample

The total sample for this study consisted of 309 university students. A nearly equal distribution of females and males were represented in this study, with 51% of the students being female. There were 99 (32%) undergraduates and 210 (68%) graduate students. Over 80% of the students in the study were pursuing either a master's of science in accounting degree or a master's of business degree. Approximately 54% of the total sample reported having had prior distance education experience.

The gender of the business school professors teaching the courses used for this study was predominately male. Of the eight professors, three were female. However, all three of the female professors had prior distance education experience, whereas this was the initial distance education experience for two of the five male professors. All professors were experienced in teaching the course content.

All of seven of the distance education courses utilized WebCT as the online course management software. With the exception of two courses meeting in person for the first meeting for the sole purpose of reviewing the technology, there were no face-to-face class meetings for any of the courses. Given the absence of any face-to-face meetings, all of the distance education courses relied on communication tools such as discussion boards, chat rooms, and instant messaging. These technologies encouraged the

students to not only communicate with the professors, but also with each other. A combination of both synchronous chats and asynchronous discussions were utilized to meet the needs of the diverse student population. The courses followed the university's 14-week schedule, so that they started and were completed within the typical semester structure. Therefore, all students participating in these distance education courses did so together at the same general semester pace, rather than allowing for courses to move at a student's pace outside the semester structure (i.e., across 20 or 25 weeks, rather than 14 weeks).

Methodology

All of the participants in this study were enrolled in one of five business courses in the areas of accounting, finance, or marketing. None of the participants were enrolled in more than one of the courses in this study. Three instruments were used to assess the student's reactions to the course taken at a distance. The first two surveys were existing University Office of Institutional Research (OIR) course evaluation forms (University of Connecticut, n.d.[b]) and were administered at the end of a standard 14-week semester in the fall of 2001 at a large northeastern university.

The third survey used in the study was the Distance Education Survey (DES) (University of Connecticut, n.d.[a]). Like the OIR course evaluation form, the DES was administered at the end of a standard 14-week semester from the fall of 2001 through the summer of 2002. The sample size for this instrument was relatively small, 35 students. A nearly equal distribution of females and males were represented, 51% to 49%, respectively.

Instruments

In agreement with the University's Office of Institutional Research (OIR) and the School of Business, the course evaluation forms used to evaluate traditional courses were converted to an online format. Additionally, the post DES was created for an online evaluation of the distance education courses.

The OIR course evaluation form was modified through the inclusion of distance education questions and a set of demographic questions. The revised OIR course evaluation form, for online use, consisted of the same 14 items, as the paper and pencil form, based on a 10-point Likert-type scale (*Unacceptable* to *Outstanding*), with an additional 10 questions added pertaining to distance education (University of Connecticut, n.d.[b]) Question 15 asked students if they thought the OIR form used for traditional courses was appropriate or not for evaluation of distance education courses. Questions 16–18 focused on the use of communication tools such as discussion boards, chat rooms, and instant messaging. The remaining questions addressed demographics such as gender, prior distance education experience, degree being pursued, and willingness to take additional distance education courses.

The DES was developed in collaboration with the faculty of the School of Business, providing content validation. This post course survey was created to evaluate some of the characteristics of the students taking these courses. The DES consisted of 53 statements designed to measure technology self-efficacy, distance education self-efficacy,

and self-regulatory skills of students enrolled in distance education courses. The participants were asked to rate the degree to which they agreed with each of these 53 statements on a 5 point Likert-type scale, (ranging from *strongly disagree* to *strongly agree*). Items 1–30 focused on technology self-efficacy, while Items 31–44 focused on distance education self-efficacy. The remaining nine questions (Items 45–53) addressed self-regulatory skills.

Results

Prior to performing any statistical analyses procedures, the data was examined for missing data, data entry errors, outliers and normality indices, as described by Tabachnick and Fidell (1996). To conduct these checks, descriptive procedures were performed. Overall, the total amount of missing data was less than 1% of the total data collected. Although there was a small amount of missing data overall, one question had a substantial amount of missing data. Fifteen participants, or 57% of the sample, did not respond to Item 35 on the DES, "I would rather that we did not learn through distance education." The data was examined to detect if this was, in fact, a data entry error. No data entry error was detected and Item 35 was removed from the data set for analyses purposes. Further examination of the data showed that there were no errors or areas of concern.

The data collected from the OIR course evaluation and DES was analyzed for each instructor. Each instructor received the mean rating for each of the first 14 questions as well as his or her overall mean rating. The data analyzed from Questions 15–25 was used solely for this study and was not reported to the instructors. Table 1 depicts the mean scores for Items 1–14 for each of the eight instructors in this study.

Table 1

Instructor's Mean Ratings for Items 1–14

Items 1–7								
Instructor	Student *N*	1	2	3	4	5	6	7
1	43	8.88	9.21	9.35	9.40	9.35	8.95	9.28
2	68	8.38	9.05	8.89	8.96	9.05	8.27	9.12
3	30	7.64	7.93	8.09	8.05	8.09	7.70	7.63
4	22	9.15	8.59	8.63	8.81	8.85	8.37	8.81
5	27	8.19	8.37	8.78	8.59	8.33	7.93	8.48
6	21	9.05	9.19	9.19	9.24	9.24	8.95	9.29
7	26	8.62	8.62	8.77	8.81	8.73	8.12	8.96
8	5	7.60	8.00	7.60	7.60	8.40	7.20	8.40

Items 8–14							
Instructor	8	9	10	11	12	13	14
1	9.19	9.49	9.53	9.58	9.37	9.79	9.51
2	8.86	9.43	9.28	9.30	8.95	9.48	8.70
3	7.37	7.83	7.81	7.98	7.57	7.81	7.29
4	8.93	8.78	8.81	9.36	8.74	9.35	8.67
5	8.96	8.70	8.89	8.04	8.44	8.07	7.30
6	9.33	9.38	9.33	9.39	9.05	9.38	9.33
7	8.92	8.73	8.81	8.81	8.81	9.04	8.04
8	7.20	7.60	7.40	7.80	8.00	7.60	8.00

Factor Analysis and Reliabilities

A principle components analysis (PCA), with varimax rotation, was run on the 53 items in the distance education survey. Due to the design of the instrument, pilot study findings, and the theoretical foundations of the study, three factors were forced into this PCA. All of the factors had eigenvalues exceeding 1.0 and the three factors accounted for 71.35% of the total variance. The three factors were labeled Technological Self-Efficacy (Factor 1), Distance Education Self-Efficacy (Factor 2), and Self-Regulation (Factor 3). A list of each factor's items and their individual loadings is presented in the Appendix.

The items loading on specific factors were reduced from the original set of items designed to measure each factor based on factor loadings and scale reliability indices.

Factor 1, Technology Self-Efficacy, contained 19 items, resulting in an alpha reliability of $\alpha = .89$. The 12 items comprising Factor 2 (Distance Education Self-Efficacy), had an alpha reliability of $\alpha = .91$. The third factor, Self-Regulatory Skills, produced an alpha reliability of $\alpha = .82$ for the final 6 items. Each of the factors proved to have good reliability estimates for affective instruments, as defined by Gable and Wolf (1993). The final composition of the three factors and their item loadings can be found in the Appendix. Individual scale scores were then computed for each participant using the arithmetic average of the individual items in each factor, respectively, as suggested by Gable and Wolfe (1993), Hopkins, Stanley, and Hopkins (1990) and Worthen, Borg and White (1993).

Research Question 1. Are course evaluation used for traditional courses appropriate for courses taught via distance education? The preponderance of students (n = 283, 92%), indicated that they believed that traditional course evaluation used by the University was appropriate for Web-based courses. Only 26 of the 309 students (less than 10%) felt that the current course evaluation was not an appropriate form of assessment for Web-based courses. Of those students who felt that the traditional evaluation was not appropriate, some felt that too much emphasis was placed on the instructor rather than the course, while others felt that more specific questions regarding distance education would be appropriate.

Research Question 2. Are there significant gender differences with respect to technology self-efficacy, distance education self-efficacy, and self-regulation measures? Three separate one-way ANOVAs were conducted examining gender and technology self-efficacy, distance education self-efficacy, and self-regulatory skills, respectively. The results failed to indicate any statistically significant gender differences for technology self-efficacy, distance education self-efficacy, or self-regulatory skills (p = .59, p = .32, p = .86, respectively; see Table 2).

Table 2

ANOVA Results for Gender **(n = 34)**

Source		*df*	*MS*	*F*	*p*
Technology Self-Efficacy	Between Groups	1	.060	2.97	.590
	Within Groups	33	.202		
Distance Education Self-Efficacy	Between Groups	1	.625	1.00	.324
	Within Groups	33	.622		
Self-Regulation	Between Groups	1	.011	.03	.862
	Within Groups	33	.345		

Research Question 3. Is there a difference in technology self-efficacy, distance education self-efficacy, and self-regulation measures based on previous distance education experience? The ANOVAs conducted for this research question (see Table 3) indicate that previous experience with distance education has a significant impact on both distance education self-efficacy (p = .013), and self-regulation skills (p = .033), but not on technology self-efficacy (p = .321).

Table 3

ANOVA results for Previous Distance Education Experience **(n=34)**

Source		*df*	*MS*	*F*	*P*
Technology Self-Efficacy	Between Groups	1	.20	1.01	.321
	Within Groups	33	.20		
Distance Education Self-Efficacy	Between Groups	1	3.66	6.90	.013*
	Within Groups	33	.53		
Self-Regulation	Between Groups	1	1.48	4.93	.033*
	Within Groups	33	.30		

*statistically significant; $p < .05$

Research Question 4. Are there significant differences between undergraduate and graduate students on technology self-efficacy, distance education self-efficacy, and self-regulation measures? This study found no significant differences between graduate and undergraduate students with regards to the three affective characteristics under study (p = .521, p = .134, p = .590).

Discussion

An overwhelming majority of students perceived the evaluation used for traditional courses to be appropriate for distance education courses (over 90%). Of those few students (less than 8%) who did not feel that the Web form was appropriate for distance education courses, none provided suggestions when given the opportunity. Using the online course evaluation, students gave both the courses and instructors very high ratings. Ratings from the first testing of the online version evaluation exceeded a rating of 9.0 on a 10-point scale. This is supportive of the belief that the evaluation form used for traditionally taught courses is appropriate for distance education courses, as judged by the students completing the form. The Web-based course evaluation form has now been accepted by the university as appropriate for distance education courses.

For the Accounting Department, the fact that 78% of the students indicated that they would enroll in future accounting courses conducted using distance education technology was very significant. Since the time of this study, the department has fully committed to an online master's degree program in accounting. Individual professors are working very closely with a team of university instructional designers, administrators, and information technology experts to put two classes per semester online. Once completed, this will be the first degree program offered by this university conducted entirely online.

Based on previous research (Chen, 1986; Comber, Colley, Hargreaves, & Dorn, 1997) we expected to find gender differences with respect to technology self-efficacy. The fact that the research found no statistically significant differences is considered an important finding. The lack of gender differences in technology self-efficacy among students may be due, in part, to the type of students who took these courses. Business and accounting students, because they use spreadsheets and database programs regularly, are apt to be more conversant with computer technology than the average student. Computer experience and efficacy may have influenced technology efficacy for courses using computer-based online technologies. Another factor that may have influenced technology efficacy perceptions among the females in the sample was the model provided by the female instructors. The expertise and modeling apparent in the female instructors may have had positive influence on the technology efficacy of the female students, as would be consistent with Bandura's work on social cognitive theory (1986). Further investigation in this area is necessary before any firm conclusions may be drawn.

The statistically significant findings regarding the effect of experience with distance education courses on distance education self-efficacy and self-regulation are consistent with the literature. If a student had previous success with a distance education course, this mastery experience (Bandura, 1997) would increase their efficacy for taking future courses at a distance. Likewise, self-regulation has been demonstrated as a critical component of distance education success (King, 2001). Having successfully completed a distance education course would reinforce and enhance the individual's self-regulation (Bandura, 2001).

The lack of differences in the three affective characteristics between the graduate and undergraduate students was a little surprising since we expected that the graduate students would report higher efficacies and self-regulation. While there were no significant college-level differences in technology self-efficacy ($p = .52$), self-regulation ($p = .59$), and distance education self-efficacy ($p = .13$), this latter value appears to suggest a tendency toward a finding that graduate students are more likely to be efficacious about distance education than are undergraduate students. However, more research, with a much larger and more diverse sample, is needed before such an assertion can be proven.

Limitations

One of the limitations that affects all of the results of this research was the low number of participants that completed the third survey ($n = 35$). The results, therefore, are not generalizable and should only be considered possible variables in a larger study.

Findings from this study are also only generalizable to those who share similar traits with the participants involved in this study. As a whole, the students used in this study are not representative of all students because of the limited domain knowledge studied. Therefore, due to the fact that upperclass undergraduate students and graduate business students participated in this study, findings can only be generalized to other similar undergraduate and graduate business students. In addition, these findings can also only be generalized to students enrolled in business distance education courses that are comparable in scope, sequence, and structure to the courses utilized in this study.

Another possible threat to internal validity is the pariticipants' age. Twenty-two of the 35 participants (63%) were in the 20–29 age range. Technology is more commonly used today that it was 20 years ago (Phipps & Merisotis, 1999). Therefore, it would be expected that younger students would have more experience with technology and in turn have higher technology self-efficacy measures. If this were to be true, then younger students may have had high technology self-efficacies prior to the study.

Conclusions

Overall, the results of this research may have significant implications for the field of distance education, as we discover variables that may be related to student success and student attitudes about distance education. These learner characteristics and variables may have a major impact on the manner in which online courses are designed and on the pedagogy that is employed to deliver them.

Although the form for traditional course evaluations successfully transferred to an online format, much more research is needed before final conclusions can be made. Additional research in the area of online learner characteristics is also required. Such research should concentrate on the factors that result in student successes in online courses, both academically (knowledge acquisition) and attitudinally (liking of the learning experience). This research might result in the development of instruments that can reasonably predict students' success in an online course prior to their enrollment. This research could also result in the development of interventions that would aid students in their preparation for online courses and contribute to their success. Such interventions might take the form of online mini-courses in study skills and self-regulatory skills, and "just in time" technology assistance through the use of automated intelligent agent features.

As noted earlier, the field of distance education, particularly online distance education, is expanding exponentially. One of the constants in the distance education equation is the student. The implications of student characteristics that contribute to online course success are critical for schools across the country that are creating classes for online delivery and offering them to wider audiences.

References

American Association of University Women. (2000). *Tech-savvy: Educating girls in the new computer age.* Washington DC: AAUW Education Foundation.

Bandura A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52,* 1-26.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.

Charp, S. (2000). Distance education. *THE Journal, 27*(9), 10-12.

Chen, M. (1986). Gender and computers: The beneficial effects of experience on attitudes. *Journal of Educational Computing Research, 2,* 265-282.

Collison, G., Elbaum, B., Haavind, S., & Tinker, R. (2000). *Facilitating online learning: Effective strategies for moderators.* Madison, WI: Atwood.

Comber, C., Colley, A., Hargreaves, D. J., & Dorn, L. (1997). The effects of age, gender, and computer experience upon computer attitudes. *Educational Research, 39,* 123-133.

Draves, W. A. (2002). *Teaching online*. River Falls, WI: Learning Resources Network (LERN).

Gable, R. K., & Wolf, M. B. (1993). *Instrument development in the affective domain: Measuring attitudes and values in corporate and school settings* (2nd ed.). Boston: Kluwer Academic.

Hara, N., & Kling, R. (2000). *Students' distress with a Web-based distance education course.* Retrieved February 16, 2000, from Indiana University, Center for Social Informatics Web site: http://www.slis.Indiana.edu/CSI/wp00-01.html

Holcomb, L. B. (2002). *Examining technology self-efficacy levels across gender in business distance education courses.* Unpublished master's thesis, University of Connecticut, Storrs.

Hopkins, K. D., Stanley, J. C., & Hopkins, B. R. (1990). *Educational and psychological measurement and evaluation* (7th ed.). Englewood, NJ: Prentice-Hall.

Kearsley, G. (2000). *Online education: Learning and teaching in cyberspace.* Belmont, CA: Wadsworth.

King, F. B. (2001). Asynchronous distance education courses employing Web-based instruction: Implications of individual study skills self-efficacy and self-regulated learning (Doctoral dissertation, University of Connecticut, 2001). *Dissertations Abstracts International, 62,* 912.

King, F., Young, M., Drivere-Richmond, K., & Schrader, P. (2001). Defining distance learning and distance education. *Educational Technology Review, 9*(1), 1-14.

Knowlton, D. S., & Weiss, R. E. (2000). Technologically enhanced courses vs. traditional instruction: Empirical evidence, reflections from practice, and designing for maximum learning. *The CyberPeer Newsletter*. Retrieved September 9, 2000, from http://www.crichton.edu/CDEALT/CyberPeer/tech-trad.shtml

Lewis, L., Snow, K., Farris, E., Levin, D. (1999). *Distance education at postsecondary education institutions: 1997–1998* (NCES 2000-013). Washington, DC: U.S. Department of Education, National Center for Educational Statistics.

Miller, G. E. (1997). Distance education and the emerging learning environment. *Journal of Academic Librarianship, 23*, 319-321.

Moore, M. G., & Kearsley, G. (1996). *Distance education: A systems view*. San Francisco: Wadsworth.

Olsen, F. (2002, November 1). Phoenix rises: The university's online program attracts students, profits, and praise. *The Chronicle of Higher Education.* Retrieved October 28, 2002, from http://chronicle.com/free/v49/i10/10a02901.htm

Palloff, R. M., & Pratt, K. (2001). *Lesson from the cyberspace classroom: The realities of online teaching.* San Francisco: Jossey-Bass.

Parker, A. (1999). Interaction in distance education: the critical conversation. *Educational Technology Review, 1*, 13-27.

Phipps, R., & Merisotis, J. (1999). *What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education.* Washington, DC: Institute for Higher Education Policy.

Regalbuto, J. (Chair). (2000). *Teaching at an Internet distance: The pedagogy of online teaching and learning* (Report of a 1998–1999 University of Illinois faculty seminar). Retrieved January 17, 2004, from http://www.vpaa.uillinois.edu/reports_retreats/tid.asp?bch=0

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist*, *26*, 201-231.

Shashaani, L. (1995). Gender differences in mathematics experience and attitude and their relation to computer attitude. *Educational Technology, 35*, 32-38.

Shotsberger, P. (2000). The human touch: synchronous communication in Web-based learning. *Education Technology, 40,* 53-56.

Shuey, S. (2002). Assessing online learning in higher education. *Journal of Instruction Delivery Systems, 16,* 13-18.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.

Tiene, D., & Ingram, A. (2001). *Exploring current issues in educational technology*. New York: McGraw-Hill.

University of Connecticut. (n.d.[a]). *Technology, distance education, and self-efficacy.* Retrieved January 17, 2004, from http://www.globaled.uconn.edu/surveys/sba/sesurvey.htm

University of Connecticut. (n.d.[b]). *The University of Connecticut Survey of Courses and Teaching.* Retrieved January 17, 2004, from http://www.globaled.uconn.edu/surveys/sba/sbaevaluation.htm

Waits, T., & Lewis, L. (2003). *Distance education at degree-granting postsecondary institutions: 2000–2001* (NCES 2003-017). Retrieved January 17, 2004, from the National Center for Education Statistics Web site: http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003017

Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks, 2,* 34-49.

Willis, B. (1993). *Distance education: A practical guide*. Englewood Cliffs, NJ: Educational Technology.

Worthen, B. R., Borg, W. R., & White, K. R. (1993). *Measurement and evaluation in the schools.* White Plains, NY: Longman.

Yellen, R. E. (1998). Distant learning students: A comparison with traditional studies. *Journal of Educational Technology Systems, 26*(3), 215-224.

Zimmerman, B. J. (1995). Self-regulation involves more than metacognition: A social cognitive perspective. *Educational Psychologist, 30*, 217-221.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39). New York: Academic Press.

Appendix

Factor Loadings

Factor 1

Question	Factor Loading
2. I find working with computers very easy.	.79
3. I am very unsure of my abilities to use computers.	.81
4. I seem to have difficulties with most of the software packages I have tried to use.	.62
5. Computers frighten me.	.59
9. I often have difficulties when trying to learn how to use a new computer software package.	.86
10. I rely heavily on instructions and manuals to help me use a computer.	.69
11. Most of the computer software packages I have had experience with have been easy to use.	.39
12. I am very confident in my abilities to use computers.	.72
13. I find it difficult to get computers to do what I want them to.	.43
14. At times I find working with computers very confusing.	.73
16. I find it easy to learn how to use a new software package.	.58
17. I seem to waste a lot of time struggling with computers.	.53
19. I always seem to have problems when trying to use computers.	.64
21. Computer jargon baffles me.	.79
22. Computers are far too complicated for me.	.87
29. I consider myself a skilled computer user.	.90
30. When using computers I worry I might press the wrong button and damage it.	.55

Factor 2

Question	Factor Loading
31. I can usually deal with most difficulties I encounter when using the Web.	.45
34. The Web can make me much more productive.	.41
35. I would rather that we did not have to learn through distance education.	.82
36. Using distance education makes learning much more fun.	.59
37. Distance education makes learning easier.	.60
38. Distance education makes learning faster.	.81
39. Distance education makes learning more difficult.	.77
40. Distance education makes learning slower.	.64
41. Distance education enables me to take this class most effectively.	.82
42. Distance education meets my personal needs.	.84
43. Distance education meets my professional needs.	.54
44. Distance education is a valuable experience for me.	.84

Factor 3

Question	Factor Loading
46. I work effectively through electronic collaborations.	.47
47. I use my time effectively.	.49
50. I have good study habits.	.55
51. I am able to monitor my time effectively.	.64
52. I am able to get things done on time.	.49
53. I tend to procrastinate.	.70