Gauging Distance Education Students’ Comfort Level With Technology and Perceptions of Self-Assessment and Technology Training Initiatives

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Gauging Distance Education Students’ Comfort Level With Technology and Perceptions of Self-Assessment and Technology Training Initiatives

Abstract
Distance education has made great strides toward enfranchising nontraditional learners. Yet, while technology has continued to evolve and develop, student support services, especially those focused on technology training and assessment, are still a critical need. This study examined a representative sample of undergraduate, graduate, and postbaccalaureate agricultural students to determine the effect of demographics and prior distance education experience on their perceptions of the need for distance education assessment and training and their comfort level with distance learning technologies. Results indicated that respondents with previous distance education experience rated their comfort level with technology lower than those students taking a distance education course for the first time. A majority of respondents also said they would engage in technology training if their assessment indicated they needed technology skills.

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Table 1. Test Scores for Online (N = 21), and Traditional (N = 17) Learner Groups

|                  | Online group          |                       | Traditional group   |                       |
|------------------|-----------------------|-----------------------|---------------------|----------------------|
|                  | Pre-test mean score   | 25                    | Pre-test mean score  | 24                   |
|                  | Post-test mean score  | 31                    | Post-test mean score | 29                   |
|                  | Score increase        | 6.4 (T = 9.15, SD = 3.2, p = <.0001) | Score increase      | 5.7 (T = 4.19, SD = 5.7, p = <.0007) |

Selected Attitudinal and Demographics Survey Results

Tables 2 and 3 show some of the results from the demographics and attitudinal surveys administered to the online learner group. Several items on the demographics and attitudinal surveys addressed questions outside the scope of this research project. Therefore, only selected items are reported here. As shown below, learners in the online group valued the convenience of participating in the program via online delivery. Results from the demographics survey show that all online participants had some level of college education and most had some years of experience using computers and the Internet.

Correlation Results

As mentioned above, items selected for analysis from the attitudinal survey had to do with user acceptance of the online course and willingness to take another online course. Items selected for analysis from the demographics survey had to do with college experience and experience with computers and the Internet.

The analysis did not indicate a correlation between acceptance of the online course and experience with computers and the Internet. However, correlation coefficients did provide evidence of linkage between several of the survey items.

Table 4 shows the correlations between college/university experience; learner acceptance of the online course; learner willingness to take another online course, and selected attitudinal/demographics survey items.

Abstract

Distance education has made great strides toward enfranchising nontraditional learners. Yet, while technology has continued to evolve and develop, student support services, especially those focused on technology training and assessment, are still a critical need. This study examined a representative sample of undergraduate, graduate, and postbaccalaureate agricultural students to determine the effect of demographics and prior distance education experience on their perceptions of the need for distance education assessment and training and their comfort level with distance learning technologies. Results indicated that respondents with previous distance education experience rated their comfort level with technology lower than those students taking a distance education course for the first time. A majority of respondents also said they would engage in technology training if their assessment indicated they needed technology skills.

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Introduction

The traditional university classroom has undergone rapid transformation due to the impact of distance education-based technologies, such as compressed video and the Internet. Indeed, corporate management consultants such as Peter Drucker have gone so far as to predict the demise of the traditional university classroom, calling it inefficient and overpriced as compared to distance education delivery methods (Bray, 1999). It’s undeniable that for many students, particularly adult learners, the opportunity to take a technology-based distance education course may be very attractive, even essential to obtaining a degree and achieving professional success. But it’s also true that adult distance learners may be very different, from the standpoint of experience, personality, and perceptions, than traditional “campus-based” university students.

Research has shown that most distance learners tend to be adults looking to return to school after an absence or to obtain a credential useful in furthering their careers. Increasing numbers of distance learners are also elderly, minority, disabled, or English-as-a-second-language students. Studies of distance education student demographics (National Center for Education Statistics, 1998) indicate that a majority of adult distance learners are female, are older than traditional students, and live 50 or more miles from the originating campus (Thompson, 1997). In addition, they may have family and work responsibilities that cause them to learn differently, perform differently, and have different perceptions and expectations about their course experiences than traditional students (Sheets, 1992).

Studies suggest that distance education may be an effective alternative for some students because it is more flexible than conventional approaches to education (Mandie-Filer, 1988). Studies over the years have shown that students who have taken technology-delivered courses through various media (computers, videotape, satellite, and interactive video) have performed, in terms of final course grades, as well or better than their counterparts in “traditional” classrooms (Moore & Thompson, 1997). However, because of their experiences with technology and life experiences, distance learners may react to a course differently, potentially causing them to have more difficulties in achieving scholastic success than their on-

Pre- and post-test score results

Table 1 shows the results of T-test analysis for pre/post test scores from the online and traditional learner groups. The pre/post-test score results were similar for the two groups. Statistical comparison of the increase in test scores for both groups indicated no significant difference in the amount of improvement in pre- and post-test scores between the groups.
Hale and Gifford, 1997; Moore and Thompson, 1990; Russell, 1998; Souder, 1993).

However, most of these studies focus on students taking for-credit courses in higher, or continuing, education situations. There appear to be relatively few distance education studies where the pre-/post-test tool has been used to compare performance of distance and traditional learners in an Extension educational program. For example, Sunnarborg, Bradley, and Haynes (1988) used pre-/post-tests to measure student learning in an Extension program on weight control and nutrition delivered via cable television. Also, Flaskerud (1994) used pre-/post-tests to compare the learning performance of distance and traditional learners participating in an interactive video workshop on commodities marketing. The authors are not aware of any studies that employed pre-/post-testing to measure and compare participant learning performance in traditional versus online delivery of Extension educational programs.

The second line of investigation in this study looks at the possibility of relationships between learners’ acceptance of an online educational program and their college experience and experience with computers and the Internet. In Lim (2001), correlation analysis was used to show that acceptance of a Web-based courses was significantly related to experience with computers, which in turn was significantly related to level of academic achievement. However, the learners in that study were undergraduate, graduate and continuing education students taking a for-credit Web-based distance education course. This study focuses on learners in a noncredit Extension educational Web-based program.

Research Methodology

Thirty-eight participants in the 2001 statewide Master Gardener training program volunteered to participate in this study. They were divided into two groups. A traditional group, which consisted of 17 learners, completed the soils module in a traditional classroom setting. An online group (21 learners) used their home computers to complete an online version of the soils module delivered via the Web.

Both groups completed a pre-/post-test consisting of 25 multiple choice and 11 true/false questions relating to the topic.

The online participants also completed an attitudinal survey.
Purpose of the Study

The purpose of this research project was two-fold. One objective was to employ pre-/post-testing to compare the learning performance of two groups of Extension clients. One group, working on computers in their homes, completed the Master Gardener training soils module delivered online via the World Wide Web. The other group completed the soils training module traditionally (face-to-face) in the classroom. The second part of the study involved only the online learner group. The second objective was to employ correlation analysis to look for statistically significant relationships between 1) learners’ education levels and 2) experience with computers and the Internet, and their attitudes toward taking a Master Gardener training course online.

It is important to emphasize that a key aim of this study was to examine learners participating in an Extension educational noncredit program. As will be explained in the following section, there are studies in the literature similar to this one, but they focus on learners in for-credit courses. We take the position that for-credit and noncredit educational programs are not the same in terms of the motivation of the learners. For example, in a noncredit program learners are not concerned about achieving a certain level of performance in order to be awarded a credit. They simply desire information that is important to them and a quality learning experience.

The researchers developed two hypotheses to meet the study objectives.

1. Extension clients taking a Master Gardener training course online learn as much as clients taking the same course traditionally (in the classroom) as measured by the scores of pre- and post-tests.

2. Extension client acceptance of the online delivered Master Gardener training course is positively correlated with experience with computers and the Internet.

Literature Review

Many studies have employed the pre-/post-test tool to compare the learning performance of students in traditional courses (instructor and learners meet face-to-face) with the performance of students in distance education courses (Baker,
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instruction and to analyze characteristics and attitudes of the learners. Statistical analysis of pre- and post-test results indicated that both online and traditional classroom learners performed similarly in terms of amount of material learned. Correlation analysis did not indicate any linkage between experience with computers and the Internet and satisfaction with the online course. However, the analysis did indicate linkage between 1) college experience and satisfaction with the online course, and 2) convenience of taking a course online and satisfaction with the course and willingness to take another online course. The major implications of this research are that online delivery of Extension educational programs can be as effective as traditional delivery, and that convenience of access is significantly associated with learner willingness to take Extension educational programs online.

Introduction and Background

A team of Extension educators at Oregon State University has been using the World Wide Web to deliver the Extension Service Master Gardener Training program to clients for the past three years. During this time, the team attempted to learn as much as possible about the learners participating in the program online. Many Extension educators at Oregon State University are concerned that online delivery of the Master Gardener training program will lessen its effectiveness. This research project was conducted to examine this question. In addition, the researchers believe it is critically important to continually evaluate the educational program delivery process, particularly when it involves a new technology such as the Web, which continues to evolve rapidly.

In December 2000, the team completed the second learning module for the Master Gardener training Web site. Focusing on soils, this module was made available to participants in the Winter 2001 OSU Extension Master Gardener training program. This paper presents the results of research conducted with the initial users of this module.

Findings

Of the students who responded (n = 31), 43.8% were 37 years of age and older, while 21.9% were traditional-aged (under 22 years of age) students. Almost two thirds (62.5%) were female, and 37.5% were male. The majority of respondents were graduate-level students (46.9%), followed by undergraduates (34.4%), and postbaccalaureates (15.6%). (As defined in this study, “undergraduates” are students pursuing a bachelor’s degree, and “postbaccalaureates” are students who have received a bachelor’s degree and are taking graduate courses, but who have not been admitted into a master’s degree program.) One student (3.1%) did not respond to this item. Most students were taking distance education courses at one of the university’s research and education centers located around the state (43.8%); another 34.4% were taking courses from home.

Student experiences with distance education and distance education technologies

Students were asked if the course they were taking was their first distance education course. Their responses were evenly divided, with 46.9% (n = 15) of respondents answering that it was their first distance experience, while the same percentage of respondents (n = 15) indicated that it was not. One student did not respond to this item. Of those who had previous distance education course experience, 67.7% had three or more previous courses, while 33.3% had taken one or two. Respondents indicated that the primary technology used in the distance education course they were taking was WebCT, followed by interactive videoconferencing, Web, and email. Students were then asked which technology they would prefer in a distance education course. In response to this item, 77.4% said they would prefer interactive videoconferencing, while 12.9% preferred videotape, 6.3% preferred WebCT, and 3.2% preferred email. (See Table 1.)

Students were also asked to indicate all of the software applications that they found most useful in their distance education course. Three fourths (24) of students found presentation software most useful, and 62.5% (20) found chat and bulletin board services most useful, while only 28.1% (9) of respondents found Web page development software, such as FrontPage or Netscape Composer, most useful.
A Case Study of Online Learners Participating in the Oregon State University Extension Service Master Gardener Training Program

Bob Rost
Ann Marie VanDerZanden

Abstract

As more and more Extension educational content finds its way onto the World Wide Web, questions persist among Extension educators about the effectiveness of online delivery. Do Extension clients learn as much from online Extension educational programs as they do from classroom-based programs? And, are Extension clients with computer and Internet experience more likely to accept online educational programs and be satisfied with them? At Oregon State University, a team of Extension educators addressed those questions via a study of learners participating in the OSU Extension Service’s Master Gardener program. The study compared online learners with traditional classroom learners and included pre- and post-testing, user surveys and correlation analysis. These tools were used to assess the effectiveness of online...
assessment through a question worded as follows: “If the assessment indicated you need some technology skills to be better prepared to complete the course, would you seek training in these technology skills?” 71.9% (n = 23) indicated that they would engage in technology training if their assessment indicated they needed technology skills, while 21.9% (n = 7) indicated that they would not engage in training.

**Student comfort level with technology**

To assess students’ comfort level with technology, a five-item, subscale index was utilized. Items incorporated into the scale asked respondents to assess their comfort level with five commonly used distance education technologies via a five-point Likert-type scale that ranged from 1 = “highly uncomfortable” to 5 = “highly comfortable.” Students were most comfortable with interactive videoconferencing and least comfortable with videotape delivery. (See Table 2.)

It was hypothesized that experience of distance education would have a significant impact on students’ comfort level with distance education technology. ANOVA results indicated a significant difference in comfort level between those who had previous distance education course experience as opposed to those students who did not, F(1,30) = 4.97, p < .04. Interestingly, comparison of means indicated that students with course experience rated their comfort level with technology lower (M = 3.82, SD = 1.14) than students who were taking a distance education course for the first time (M = 4.11, SD = 1.07).

Main effects were also predicted for the effect of educational level, gender, and age on respondents’ comfort level with

| Technology               | Mean | SD  |
|--------------------------|------|-----|
| Interactive videoconferencing | 4.15 | .99 |
| WebCT                    | 4.09 | 1.11|
| Web                      | 4.04 | 1.21|
| Email                    | 4.04 | 1.56|
| Videotape                | 3.96 | 1.37|

1 = “highly uncomfortable” to 5 = “highly comfortable.”

Standardized item alpha for the resulting index was .80.
distance education technologies. One-way ANOVA results showed significant differences between males and females, $F(1,29) = 6.33$, $p < .02$ and undergraduates, postbaccalaureates, and graduate students, $F(1, 29) = 4.44$, $p < .02$ in terms of their comfort level with distance education technologies. No significant differences were observed for the effect of age on comfort level. Comparison of means indicated that males were significantly lower in comfort level ($M = 3.11$, $SD = 1.55$) than females ($M = 4.23$, $SD = .91$).

Comparison of means using Scheffe’s test showed that graduate students rated themselves as significantly higher in comfort level than undergraduates and postbaccalaureates, and postbaccalaureates rated themselves as significantly lower in comfort level. (See Table 3.)

### Discussion

In this study, results indicated that respondents were highly comfortable with the various technologies used in the classes, yet when asked, they said they would prefer an interactive videoconferencing course over a course delivered by other technologies. This may be because of the more personal nature of interactive videoconferencing, where faculty and students can see each other by television in real time. More women than men were comfortable with the technologies used in their courses. Additional research needs to be conducted to further investigate why women may feel more comfortable with distance education technologies.

Students who had taken one or more distance education courses previously felt less comfortable with the technologies than those who were taking a distance education course for the first time. This could be because first-timers did not know what

### Table 3. Effect of Educational Level on Comfort Level with Distance Education Technologies

| Ed level          | Mean | n  | SD  |
|-------------------|------|----|-----|
| Graduate          | 4.40 | 15 | .70 |
| Undergraduate     | 3.76 | 9  | .97 |
| Postbaccalaureate | 2.96 | 5  | 1.57|
| **Total**         | **3.82** | **30** | **1.28**|

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was involved in distance education course delivery and interaction and had not experienced technical problems or issues relating to mediated education that the others with previous distance education courses may have had.

In addition, graduate students were more comfortable with distance education technologies than undergraduate or postbaccalaureate students. This is not surprising, considering that people pursuing their master’s or doctorate degrees probably have access to computers and related technologies and have used them in their careers to communicate and interact with colleagues in their office or, conceivably, around the world. Postbaccalaureate students may not have had the opportunities to work with distance education technologies while they were undergraduates, which may explain their anxiety in their distance education courses.

Interestingly, respondents initially did not want to take self-assessments that might help predict their likelihood of distance education success. However, they said they would be willing to undergo technology training, if a lack of technical skills was identified in a self-assessment. This may indicate that, although students may perceive of a distance education course as they would a traditional course in terms of content delivered, they are not necessarily completely confident in their technical abilities to succeed in a technology-mediated course. One recommendation for universities engaged in distance education would be to provide students a voluntary, nonthreatening self-assessment—especially one dealing with technology skills—to allow them to identify areas in which they may need additional skills or knowledge, followed up by information on technology training options.

Results from this study indicate that nontraditional students are still the “norm” for distance education courses. Students, overall, felt comfortable with technologies used to deliver distance education courses, but students pursuing advanced degrees were more comfortable with these technologies. Results from the study indicate that universities should invest resources to help all students identify areas where they may need technical skills-building in order to succeed as distance education students. Although respondents in this study did not initially want to take a self-assessment, the idea of providing students with the opportunity to take a self-analysis should be investigated more closely. Any action that would assist stu-
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dents in becoming more successful in a mediated education environment, would, it could be assumed, have a salutary effect on both the students and the distance education program in which they are enrolled.

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