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Student's Acceptance of Technology-BasedCourse Offerings -An Empirical Assessment

Rassule Hadidi
University of Illinois at Springfield, rhadi1@uis.edu

Student Attitudes Toward Internet-Resident Course Materials

David Jankowski,
Ph.D. (doctorj@csusm.edu)
College of Business Administration
California State University, San Marcos
San Marcos, CA 92096-0001
(760) 750-4235

Abstract

There has been very little research aimed at evaluating the influence that advanced networking technologies such as the Internet have on higher education outcomes. Results of a survey of students who have completed a course with Internet-resident materials indicates that the students approve of the World Wide Web (WWW) as an effective means of disseminating course materials. Further, the students prefer the WWW to traditional paper distribution as a means of receiving these materials. While students perceive that home access to the Internet is an advantage while taking an Internet-resident course, there was no significant difference in the course performance of students with Internet access from home versus students without Internet access from home.

Introduction

The proliferation of the Internet, as a communications medium and as a mechanism for hosting and delivering course material has resulted in the appearance of a large number of applied (e.g., Carlson, Guzdial, Kehoe, Shah, & Stasko, 1996) and normative (e.g., Partee, 1996) works in the literature of many disciplines. However, there has been very little research evaluating the effectiveness of the Internet in support of higher education.

This paper describes the preliminary results of research aimed at determining student attitudes toward working with course materials that are accessible only from the Internet. The long-term goal of the research is to examine the attitudinal differences, as well as the course performance differences, between those students who have Internet access outside of school versus those students who must rely solely on the campus computer labs for Internet access.

Background

Despite the interest in Web-based teaching and learning in higher education, there is insufficient research evidence to support claims for its effectiveness (Reeves, 1997). Barron and Orwig (1997) acknowledge that networking technologies such as the Internet have not been fully analyzed, and that the integration of multimedia supported by the WWW creates additional variables that further complicate the evaluation process.

Previous research focusing on the integration of technology into education shows several benefits, including increases and improvements in active learning, critical thinking, motivation, cooperative learning, and communication skills (Barron & Orwig, 1997). Technology has also been shown to enable students to learn at their own pace, promote multisensory delivery, expand multicultural education, and provide support for students with special needs (Barron & Orwig, 1997).

To date, virtually all of the evaluative research investigating new technologies in education has focused on multimedia, while the few published studies investigating the use of advanced networking technologies, such as the Internet, have been mostly exploratory in nature. For example, Granger and Lippert (1995) describe a course project requiring students to write a paper utilizing email as the sole communication medium among the students and with the instructor. The results indicate that the number of email messages transmitted by a project team did not influence the project grade. Clark and Scott (1995) describe two

sections of a programming course that differed by utilizing an electronic bulletin board to support one section. While students responded positively to using the bulletin board, there was no difference in course performance between the two sections. Further, there was no significant correlation found between bulletin board activity and course performance in the section utilizing the bulletin board. Morris (1996) describes a course that utilized the WWW as a repository for course materials. While the students were enthusiastic about the materials, the students rarely accessed the materials outside of class time.

Methodology

The current study examines student attitudes toward Internet-resident course materials for an upper-division business elective focusing on the Information Superhighway. The course prerequisites are upper-division standing and satisfaction of the university's computer competency requirement. The course is generally offered twice each semester, with a typical enrollment of 20-25 students. The course is taught in a microcomputer laboratory, with each computer having access to the Internet. While the course includes instruction on using the Internet, the focus of the course is on the business, technology, and social issues surrounding the Information Superhighway. The course views the Internet as a support mechanism, in much the same way that a library has been traditionally used to support a university course.

On the first day of the course, students are shown how to access the course syllabus on the WWW. 1From the course syllabus the students may access the course assignments, notes, and readings. No paper is distributed to the students, nor are any course materials available from the bookstore or library.2 The course syllabus, calendar of events, and assignments are formatted as HTML documents. All assignments in the course require an extensive amount of research that must be conducted over the Internet. Course notes are available in three formats: HTML, PowerPoint (stored on a campus ftp server), and ActiveX. Students who do not own PowerPoint on their home computers are provided with the PowerPoint reader. Course readings are scanned documents in Visioneer PaperPort format (stored on a campus ftp server). All students are provided with a copy of the scanner viewer in order to view the readings from home. During the first half of the semester, course announcements are made via electronic mail, while during the second half of the semester the announcement are made via the Usenet bulletin board system.

Course materials may be accessed from any computer in the campus computer labs, as well as from the classroom computers. The university provides free documentation and Internet connectivity software for all students interested in accessing the Internet from home. Internet connectivity workshops are provided at no charge for those students who are hesitant to install the connectivity software on their own. All necessary client software, including email, WWW, Usenet, ftp, and telnet, as well as dialup access, is provided to all students at no charge. The university also offers a dialup help desk, accessible via drop-in visit, phone, or email, to assist students in solving any dialup problems they may encounter.

At the end of the semester, students are required to complete a survey that gauges their attitudes toward the use of technology in support of the course.3 The survey consists of 78 closed-ended questions in seven areas: 1) Availability of a computer and Internet from home; 2) Use of on-campus computer facilities to access course materials; 3) Use of in-class computer facilities; 4) Use of electronic mail and bulletin board for class communication; 5) Use of the WWW as a mechanism for hosting course materials; 6) Access method of lecture materials; and 7) Use of computer-based lecture notes. The survey has been delivered to four sections, covering all sections in spring 1996 and fall 1997. The response rate for each section was 100%, giving a total of 87 usable surveys.

Discussion of Results

The first part of the survey focuses on the student's computer and Internet availability outside of the university.4 Eighty-three percent of the students own a personal computer, while 56% of the students have access to the Internet (68% of computer owners).

Several of the survey questions focus on the students' attitudes about accessing course materials from the WWW. Access of Web-based course materials outside of regular class hours was indicated by 78% of the students. The remaining 22% confined their access of the course materials to class time by printing the assignments, notes, and readings during class.

The students favorably received the use of the WWW as a host and delivery mechanism for course materials. The following statements were presented to the students using a standard five-point Likert scale (1=Strongly Agree; 5=Strongly Disagree):

* The WWW is an effective means of delivering a course syllabus to the students. (1.34)

* I prefer receiving a paper syllabus rather than a syllabus accessible (and printable) from the WWW. (3.82)

* The WWW is an effective means of delivering course assignments to the students. (1.56)

* I prefer receiving paper versions of assignments rather than assignments accessible (and printable) from the WWW. (3.90)

* The WWW is an effective means of allowing students to access the course notes. (1.51)

The students clearly agreed that the WWW was an effective means of disseminating course materials, and preferred WWW distribution to traditional paper distribution of course materials.

The personal computer has long since become ubiquitous in higher education. The use of the Internet appears to be following in the personal computer's footsteps. Just as university faculty and administrators have had to deal with the issue of personal computer access for all students, so they must now deal with the issue of Internet access for all students. The following statements were presented to the students using a standard five-point Likert scale (1=Strongly Agree; 5=Strongly Disagree):

* A student who owns a computer but does not have Internet access from home has an advantage in this course over a student who does not own a computer. (2.78)

* A student who owns a computer and has Internet access from home has an advantage in this course over a student who owns a computer but does not have Internet access from home. (1.61)

* A student who owns a computer and has Internet access from home has an advantage in this course over a student who does not own a computer. (1.44)

The students clearly perceived the ability to access the Internet from home (which necessitates computer ownership) as an advantage in the course. However, this perception did not translate to the actual course outcome, as there was no statistically significant difference in course performance (final course percentage) between the three groups of students (no computer = 84.12, computer only = 83.42, Internet access = 83.14).

Conclusion

This study, while exploratory in nature, was conducted with a reasonably large sample - 87 students. While a control section taking the same course, but with a traditional delivery of course materials, was not utilized, the validity of the results presented here is not necessarily diminished by the absence of such control. All of the students involved in the study had a lifetime of experience with paper dissemination of materials upon which to help them draw their conclusions. Further research is planned into the actual behavior of the students in accessing the Internet and the course materials.

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1 http://www.csusm.edu/public/jankowski/superhighway/syllabus.html

2 The one exception is the submission and return of assignments. Nearly 70% of the students expressed a desire to have homework submissions and returns managed via electronic mail.

3 A copy of the survey is available from the author.

4 The university has no dormitory facilities - all students are commuters.