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Abstract

Web-supported instruction is becoming more commonplace in today's colleges and universities (Lindner, Dooley, & Murphy, 2001). This paper explores student perceptions of the use of WebCT to support instructional objectives in a Web-supported environment. Data for the study were collected with a survey instrument using WebCT on-line testing tools. The results show WebCT contributed to students' ability to accomplish the course objectives. Students, however, continued to rely on print-based course materials and did not create student-centered on-line learning environments.

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Abstract

Web-supported instruction is becoming more commonplace in today's colleges and universities (Lindner, Dooley, & Murphy, 2001). This paper explores student perceptions of the use of WebCT to support instructional objectives in a Web-supported environment. Data for the study were collected with a survey instrument using WebCT on-line testing tools. The results show WebCT contributed to students' ability to accomplish the course objectives. Students, however, continued to rely on print-based course materials and did not create student-centered on-line learning environments.

Introduction

A recent report by the National Association of State Universities and Land-Grant Colleges (1999) stated that 81% of adults believe that furthering their education is important for them to be successful. Colleges and universities have responded to the growing demand for post-secondary education by developing and offering courses at a distance. Distance

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education continues to expand because of growth of the Internet, increasing proficiency in basic Internet skills, and shrinking barriers with respect to accessing and using the Internet (Lindner, 1999).

Distance education methods include those that permit any education received by a student to occur when the teacher and the student are separated by location and/or time. Distance education relies on the students' abilities to be self-directed and internally motivated. This type of education is particularly appealing to students whose lifestyle (time and distance constraints) does not allow them to take advantage of traditional classroom methods. To optimize methods of delivering instructional programs, a need exists to examine continually technologically mediated delivery strategies (Murphy & Karasek, 1999); which is to say, how can teaching be improved through the use of technology (Means, 1994)?

Web course tools (e.g., static and dynamic Web pages, threaded discussion groups, E-mail, chat, instant messaging, streaming media/video, animations, application-sharing, IP audio/video conferencing) are being adopted and used increasingly by teachers to optimize delivery of instructional material (Olliges, Wernet, & Delicath, 1999). Web-based instruction can be classified into one of three categories: Developed, dependent, or supported (Murphy & Karasek, 1999). Courses delivered entirely on the Web are called fully developed. Web-dependent courses have major content components on the Web, but rely also on other delivery methods. Courses that have auxiliary materials, links, additional readings, and support materials on the Web are referred to as Web-supported. The subjects in the study presented here were enrolled in a Web-supported course.

Web course tools, like all educational technologies, may affect educational outcomes. Educational technologies can contribute to students learning stated objectives of a course, can be neutral, or can distract from learning. A widely-supported position is that technology can contribute to student success (National Center for Education Statistics [NCES], 1999).

For the purpose of this study, student success was defined as the accomplishment of the measured course objectives. According to the Web-based Education Commission (2000),

Web-based instruction supports student-centered learning, takes advantage of students' unique competencies, and enables students to participate in lifelong learning. In many cases, technologically supported instruction facilitates more rapid and deeper understanding of the course objectives (Murphy & Karasek, 1999).

Technology can also distract from learning. Donaldson and Thomson (1999) found that Web course tools support learning-centered approaches to instruction and facilitate communication among students and instructors. They cautioned, however, that Web course tools might not be useful when they act merely as a conduit through which instruction and information are delivered.

One emerging technology that holds promise for improving instructional effectiveness and efficiency is WebCT.

WebCT is a commercial software set of Web course-development tools for creating instructional environments at a distance (WebCT, 2001). Little research has focused on the effectiveness of WebCT as a delivery strategy. Olliges, Wernet, and Delicath (1999) found that student satisfaction with WebCT was significant and positively related to prior experience of students and instructors with WebCT. Further, high student satisfaction with WebCT allowed instructors to focus on course content instead of course tools. Freeman (2000) found that lack of reliable access, both at home and on-campus, to computers and the Internet was a major barrier that negatively affected students' ability to participate in courses that used WebCT. Overall, however, Freeman (2000) reported that students felt WebCT had a positive impact on their learning.

As on-line teaching continues to grow, more information about the impact that Web course tools, such as WebCT, have on student learning is needed to make decisions about the appropriateness and effectiveness of Web-based instruction (Heinich, Molenda, Russell, & Smaldino, 1999).

Purpose and Objectives

The purpose of this study was to investigate student perceptions of the use of WebCT to support instructional objectives in a Web-supported environment.

Specific objectives of the study were to describe and explore perceptions of students enrolled in *AGED 440: Principles of Technological Change* regarding:

1. Whether or not the use of WebCT contributed to their success in the course.
2. Their ability to access and use on-line course material.
3. Their ability to access and track grades and progress on-line.
4. The creation of on-line learning environments among the students in the course.
5. Their overall perceptions of WebCT.

Methods and Data Sources

The subjects were students (N=111) enrolled in *AGED 440: Principles of Technological Change* at Texas A&M University during the Fall 2000 semester. *AGED 440* is an upper division, undergraduate-level course focusing on processes by which professional change agents influence the introduction, adoption, and diffusion of technological changes. The course was supported with WebCT. At the beginning of the course, students were given a general introduction to WebCT. They were instructed how to create a user name, and were shown the course materials and WebCT features available to the class. Additional support and instruction were provided to students individually as requested throughout the semester. All students in the course created a user name and logged onto WebCT at least once. Through WebCT, students were able to access grades and determine their progress in the course; access and print course materials; and create an interactive on-line learning environment between and among students and instructor through E-mail, threaded discussion, on-line testing, and study guides. The research design for this study was descriptive and exploratory in nature (Fraenkel & Wallen, 1999). A census of all students enrolled in *AGED 440* was conducted. The results of this study are not generalizable

The survey instrument was pilot-tested with twenty students enrolled in another course in the Department that was Web-supported. Minor wording changes were made as a result of the pilot study. The instrument consisted of open-ended and closed-ended research questions:

1. Did WebCT contribute to your success in this course? Please describe.
2. What influenced your decision to purchase or not purchase a course packet?
3. Did you access and track your grades and progress in the course on-line? If yes, what did you think of this process? If no, why not?
4. Did you use WebCT to create an on-line learning environment among students through E-mail, threaded discussion, on-line testing, study guides, etc., to increase your success in this course? Why or why not?
5. Please provide any additional comments regarding the use of WebCT in this course.

Responses were independently categorized and coded by trained scorers based on themes identified in written responses (Miles & Huberman, 1994). The scorers were in complete agreement for 500 (94%) of the 534 responses. Student responses to open-ended statements were categorized as positive, neutral, or negative and coded 1, 2, or 3, respectively. "Yes" responses to closed-ended statements were categorized as positive and coded as 1. "No" responses to closed-ended statements were categorized as negative and coded as 3.

Content validity of the instrument was established by a panel of experts consisting of faculty members at Texas A&M University. A panel of graduate students, also at Texas A&M University, established face validity. Evidence of reliability and validity, additionally, was established by documenting the bases for inferences, describing the context in which the questions were asked, documenting the sources of written responses, and gathering the data in their natural setting (Fraenkel & Wallen, 1999). The instrument was administered using WebCT on-line testing tools. Participants were given two weeks to respond. Once participants accessed the password-protected instrument, they had one opportunity to respond to each question. Responses to the questions were then submitted on-line to the researchers. Eighty-nine students participated in the study. A response rate of 80% (n=89) was achieved.

Results

Objective 1

Most students (72%) indicated that the use of WebCT in *AGED 440: Principles of Technological Change* contributed to their success in the course (see Table 1 on page 42 for Objectives 1-5). An example comment from one of the students who indicated a positive experience was "WebCT has allowed me to look up homework and view other class material on the Web. I like WebCT because you can send messages to teachers and they can send any important notes to anyone. Also, WebCT allows me to pull notes and reviews for quizzes or exams."

However, 21% of students did not feel WebCT contributed to their success in the course. An example comment from one of the students who indicated a negative experience noted WebCT "was hard to get onto and some people have a hard time accessing computers . . . plus the regular Web-site was working fine." Seven percent of respondents had neutral perceptions of WebCT. One student stated, "The only thing this has done is make sure I get my grades faster. I think if we had the other things such as quizzes and things like that, it would be more useful."

Objective 2

Seventy-six percent of the participants indicated that they purchased the course pack even though the materials were available free through WebCT. A typical positive response to this question was, "The reason I purchased a packet was because the packet had everything I needed in it, and I did not have to worry about going to the computer lab every week and reading the material on-line." Twenty-four percent of participants did not purchase the course pack and relied solely on the on-line materials. One student noted, "No, I did not purchase the packet. I printed all the notes off of my personal computer at home. It is easier to print at my home." Another student, however, stated, "No, I didn't buy a course packet, but now I wish I would have, because it won't always print out everything. It has a lot of errors, and then I don't have the stuff for class."

Once students accessed the course schedule and materials, they could read and print course materials (Topics) for each class session. The course material was presented in Adobe®

Table 1 Student Perceptions of WebCT, AGED 440, Texas A&M University, Fall 2000 (n=89)

Variable	Student Response							
	Positive		Neutral		Negative		Total	
	f	%	f	%	f	%	f	%
Contribution of WebCT to student success	64	72	6	7	19	21	89	100
Student use of online course material	21	24	0	0	68	76	89	100
Student ability to access and track grades and progress	82	92	0	0	7	8	89	100
Student reaction to accessing and tracking grades online	74	83	11	12	4	5	89	100
Ability of student to use to create online learning environments using WebCT	15	17	1	1	73	82	89	100
Overall student perception of WebCT	79	89	3	3	7	8	89	100

Acrobat portable document format (PDF). PowerPoint™ handouts were available for printing with three slides per page. Additional course readings were also made available in PDF format.

Objective 3

Most students (92%) were able to access and track their grades on-line using WebCT. Eight percent did not access and track grades on-line. Of those who had accessed and tracked their grades, 83% indicated they had a positive experience in doing so. Twelve percent were neutral about tracking their grades, and 5% indicated the experience was negative. An example comment from one of the students who indicated a positive experience was "Yes, I do track my grades on WebCT, and I really like this aspect of WebCT. I feel this in the future can lead to less work for the professors, and a quicker response on grade distribution." In general, students who did not access and track grades and progress on-line indicated doing so was a poor use of their time because grades were available in the lab sections and they had limited access to computers.

Objective 4

Even though student photos and contact information were made available, 82% of the participants did not use WebCT's E-mail, threaded discussion, and study guide features to create an on-line learning environment to increase their ability to accomplish measured course objectives. An example negative student comment was "No, there are not enough users yet to develop a substantial network; however, I believe it will be utilized in this manner in the near future." Another student noted, "I have not used this on-line service as of yet. I have been able to read messages from my professors, which is really nice. I have not used any of the other services because I feel that I have not needed to at this time. Although, if I need to, I know I will have this available to me." Several students indicated limited access to an on-line computer contributed to their not using WebCT's on-line learning environment features. Seventeen percent of the respondents used the features mentioned above to create on-line learning environments. Students indicated three major reasons for using WebCT's on-line learning environment functions: communication between students and with professors; access to course notes and handouts; and access to on-line test reviews and study guides.

An example positive student comment was, "It helped me meet people, as well as learn about people. E-mails have helped out too." Another student noted that they used the on-line learning environment functions "because [they] study better with one other person and it is easier to get together on the Net to find that help." One student provided a neutral response.

Objective 5

Overall, most students (89%) had positive perceptions regarding the use of WebCT in *AGED 440: Principles of Technological Change*. One student who had a positive overall experience with WebCT noted, "I feel WebCT has been helpful and feel every course should use it." Eleven percent of participants had either negative or neutral perceptions regarding its use. Students who had negative or neutral overall perceptions towards WebCT indicated that difficulties logging in and using it led to frustration and ineffectiveness. Access to computers and printers and slow data transfer rates contributed to students' negative and neutral perceptions. Several students stated that unlike computers, books do not "crash" in the middle of the night or right before a quiz.

Conclusion, Discussion, and Implications

As noted earlier, the results of this study are not generalizable to students other than those who took *AGED 440* during the fall semester, 2000. Replication of this study with other classes and in other settings would strengthen the generalizability of findings. These findings, however, provide information and insights about on-campus student perceptions, with respect to Web-supported courses, that administrators and instructors should consider when incorporating distance education technologies into traditional classes.

In a Web-supported instructional environment, students in this study perceived that WebCT contributed to their ability to accomplish the measured objectives of the course. This perception, however, was diminished when students did not have easy access to reliable computers with high-speed connections to the Internet. This finding is consistent with Freeman's (2000) conclusion that poor accessibility to computers and the Internet negatively affected students' ability to participate in courses that used WebCT. Teachers can enhance students' perceived ability to accomplish the measured

objectives of a WebCT- supported course by helping students access publicly available and reliable computer resources. In addition, teachers should provide minimum recommended system specifications for students considering enrollment in a Web-supported course, so that students can make informed decisions about whether or not to enroll.

Although course materials were available on-line, students in this study tended to prefer traditional print material to WebCT-delivered course materials. Students wanted to have a hard copy of course materials, and very few relied solely on computer-based files. The cost to purchase course materials from a "copy" store is comparable to printing costs at computer labs and is less labor-intensive for students. Teachers should not assume that students are willing or able to receive course materials exclusively from on-line sources and should make materials available through a variety of channels. As more teachers make course materials available on-line, additional inquiry is needed to assess the advantages and disadvantages of such practices.

WebCT's capabilities for accessing grades and progress were used by students more than any other feature. Students were able to access grades anytime. Further, grades were posted to WebCT immediately after scoring. Students did not have to come to the office or wait until the next class meeting to read grades posted on a bulletin board. These results indicate that teachers should use the grading functions of WebCT to provide students with more timely feedback.

The students in this study did not or were not able to take advantage of WebCT's capabilities to enhance their learning by creating student-centered on-line learning environments. According to Donaldson and Thomson (1999), Web course tools can enhance student learning and facilitate communication among students and between students and teachers. The fact that the students were located on-campus, and could interact in person, may have affected the results presented in this study. Other factors that may have contributed to negative student perceptions and adoption of this feature of WebCT include newness of the technology, early adopter problems, limited instruction in the use of WebCT, and lack of ongoing support. Students, further, may have perceived WebCT as merely a conduit through which course instruction and information were delivered because no graded activities in the

course were dependent on student use of WebCT. Donaldson and Thomson (1999) noted that when students perceived Web course tools as being merely a conduit, they were less likely to react positively to the technology. In an effort to increase student satisfaction with WebCT's on-line learning environment functions, teachers should consider using multiple learning activities and graded assignments that require students to interact on-line.

Teachers should also consider the need to provide an adequate amount of instruction and support to facilitate student proficiency with WebCT. Research is needed to explore the relationship between student adoption of WebCT and the amount of training and support provided. It is possible that the students in this study may have taken more advantage of WebCT's on-line learning environment functions if they had received additional instruction and support.

Additional research is needed to explore the relationship between student achievement, or the ability to accomplish the measured objectives of a course, and the use of Web course tools. For example, do students in classes supported with Web course tools perform better on measures of acquiring knowledge than students in classes not supported by Web course tools?

This study found that students' overall perceptions of the use of WebCT in a Web-supported course were positive. Students' positive response to WebCT is good news for teachers who are incorporating or wish to incorporate educational technology into their teaching. Instructors, however, need to recognize that not all students are willing or able to use WebCT and may need to make alternative options or support mechanisms available for them. Additional research on Web-based instructional delivery methods is needed to understand better optimal methods for delivering instruction. As WebCT and other on-line course tools become more commonplace, and as students become more familiar with the technology, it is expected that student learning, teacher effectiveness, and course efficiencies will improve.

Keywords

Distance education, delivery strategies, instructional technologies

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