STUDENT PERCEPTIONS TOWARD CASE BASED INSTRUCTION DELIVERED VIA THE WORLD WIDE WEB

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Abstract

Student perceptions of World Wide Web delivery methods of a Case-based Turfgrass course were measured using a double-scaled Likert-type instrument containing 16 questions. A total of 35 students – 26 from Penn State (originating site) and nine from Rutgers were enrolled in the course. Overall, the perceptions of Penn State and Rutgers students toward the use of the World Wide Web for instructional delivery were favorable. Students generally agreed or indicated undecided perceptions on the benefits. Students at the Rutgers site indicated displeasure with the World Wide Web as a delivery method, since its "firewall" postponed download time. At the completion of the course, Penn State students expressed a need for advanced training on uses of the World Wide Web. Recommendations included the need for all students to have equal "speed" access to course-related Web sites. Student comfort with computer use should be considered prior to delivering courses using the World Wide Web.

Introduction

Although the history of the Internet in education is short-lived, many screens could "tell a thousand stories." As vast resources on the Internet increase exponentially, so do educators interests of instructional delivery models and cutting-edge techniques for Web-based or Web-supplemented courses. Web-based authoring tools such as WebCT and FirstClass have provided additional distance education opportunities to numerous institutions. Researchers in many disciplines of education are beginning to explore the efficacy of delivery using such Web-based courses (Dabbagh & Schmitt, 1998; Shearer & Rose, 1998).

Theoretical Framework

Studies by faculty in agricultural education have provided evidence of the Internet's effectiveness as a competitive medium for course delivery and/or course supplementation (Newman, Raven, and Day, 1996; Day, Newman and Raven, 1996; and Terry and Briers, 1996). Shih & Gamon, 1998, found that students in Web-based courses enjoyed the convenience and self-controlled learning pace and were motivated by competition and high expectations. Furthermore, the researchers concluded that students with different types of learning styles could learn equally well in Web-based courses. In consideration of the successes of instruction and supplementation with the World Wide Web, experimental uses of mixing the medium with established pedagogical practices is necessary for maximizing its potential in education. One successful educational practice is the use of Case-based learning.

Case-based instruction involves the use of case studies, called decision cases, to expose students to problem situations in which they identify with -- or assume the role of -- the decision-maker. This type of instruction involves little or no lecturing; rather, the instructor employs "discussion teaching" methods by which students are led through a process of inquiry and from which learning largely occurs through discovery (Christensen, 1991).

A case is an incomplete narrative of a problem situation that takes the student to the point at which a decision has to be made. A more-detailed definition provided by Christensen (1987) is "a partial, historical, clinical study of a situation, which has confronted a practicing administrator or managerial group. Presented in narrative form to encourage student involvement, it provides data -- substantive and process -- essential to an analysis of a specific situation, for the framing of alternative action programs, and for their implementation recognizing the complexity and ambiguity of the practical world."

Under the guidance of a competent instructor, students can develop an array of important "process" skills through their exposure to case-based learning. Using an adaptation of Kolb's Learning Cycle Model developed by Turgeon (1993), students begin by concisely and accurately describing the situation presented in the case. This is called the "divergence" phase. Students then conduct a thorough analysis of the situation by drawing on their relevant knowledge to interpret and enrich their understanding of the situation; thus, known as the "assimilation" phase. In the subsequent "convergence" phase, students attempt to identify the issues emerging from the analysis and propose strategies for addressing them. Finally, after selecting an appropriate strategy, the students develop a detailed action plan for operationalizing the strategy to improve the situation -- the "accommodation" phase of the process. Often, students realize that successive iterations of this process may be needed to satisfactorily resolve a complex problem situation.

"Electronic communication information, and imaging technologies will improve how we teach in agricultural education settings…" and will "allow us to reach more students, more effectively, with better information," (Murphy & Terry, 1998). As expert knowledge is delivered using innovative media such as Case-based instruction,

evaluation of its acceptance and efficacy will be necessary. Moreover, recommendations have been made to investigate which subject matter topics can be delivered using distance education technologies (Swan, 1998).

Purpose & Research Questions

The purpose of this study was to assess changes in student perceptions of the World Wide Web for deliveries of course case studies. The research questions used to meet the purpose of this study include:

1. Did student perceptions about the benefits and challenges of using the World Wide Web for course materials delivery change significantly after experiencing it?
2. Were there differences between students' perceptions of the World Wide Web for Case study delivery at the remote site and the originating site?

Methods/Procedures

The population of this study consisted of two groups of students in a senior-level turfgrass management course, "Case Studies in Turfgrass Management," during the Spring 1996 Semester. The course was delivered to 30 students face-to-face at the Penn State – University Park campus and by compressed video to 10 students at the Rutgers University campus in New Brunswick, New Jersey. The World Wide Web was used to deliver Case-based instructional materials for the course, coupled with extensive use of e-mail for interaction between the instructor and students. Because of the small size of the population, a census study was used for the study.

A double-scaled Likert-type questionnaire was used to collect data relating to changes in student perceptions of the use of the World Wide Web for course material delivery. Questions for the instrument were developed from a synthesis of distance education literature. Students' perceptions about the benefits and challenges of the World Wide Web were assessed in a pretest and a posttest. Perceptions were measured on 16 items using a five-point Likert scale ranging from "strongly agree" to "strongly disagree." Face validity was established by a panel of experts in the Department of Agricultural and Extension Education at Penn State. Due to the timing and nature of the study, a post-hoc reliability analysis was used on the 16 items. Cronbach alpha reliability test item scores ranged from .87 to .89, with an overall coefficient of .89. Analyses of data included means, standard deviations, and paired T-tests. For statistical analysis, the researcher considered the students in the class to represent a "Slice of Life" sample of Penn State and Rutgers Students (Oliver & Hinkle, 1981). This theory is based on the premise that the population in the study is representative of a larger relative group. Students were asked to respond to statements regarding the delivery medium prior to and following the course. All students completed the instrument at the session preceding the final class of the semester. The data gathered from the survey were analyzed using the Statistical Package for the Social Sciences for Windows (SPSS).

Results/Findings

Eight of the items related to students' perceptions of the benefits of using the World Wide Web to deliver course materials and 8 that related to challenges. The mean pretest score for benefits statements was 2.7, meaning that students either agreed or were undecided about the benefits of the World Wide Web for course materials delivery. Students were undecided about the challenges of using the World Wide Web for delivering course materials (mean = 3.0). The posttest mean for benefits dropped only slightly to 2.6 while the mean for challenges remained at 3.0. On the whole, the pretest and posttest results indicate that students' perceptions about the use of the World Wide Web to deliver course materials did not change significantly after participating in the course. Table 1 shows the individual scores for all the 16 benefits and challenges items.

A paired T-test procedure revealed changes in perceptions on specific items relating to Penn State students' perceptions about the benefits and challenges of using the World Wide Web for course material delivery. Statistically significant differences ($p<.05$) were found between pretest and posttest perceptions about using the World Wide Web for course materials delivery (Table 2). Students differed on their perceptions about the accessibility of course materials ($t = 2.77$), amount of time spent ($t = 2.32$), amount of distraction ($t = -2.48$), the World Wide Web as a poor choice for delivering materials ($t = -2.52$), and lack of training ($t = -3.28$).

Table 1.
Mean Scores and Standard Deviations of Students' Perceptions of the Benefits and Challenges of the World Wide Web for Course Materials Delivery

Item	Pretest	Posttest
The World Wide Web is an appropriate delivery medium for course materials in TURF436W.	2.61 (.97)	2.77 (1.35)
I have problems accessing course materials through the World Wide Web.	2.64 (1.19)	2.46 (1.50)
Technical difficulties using the World Wide Web restricted my learning.	2.82 (1.07)	2.53 (1.42)
Having all of the course materials easily accessible is important to me.	1.79 (1.14)	1.53 (.94)
Delivery of course materials via the World Wide Web enhances my learning.	2.90 (1.07)	2.91 (1.21)
The computer restricts learning because it is "impersonal."	3.15 (1.00)	3.24 (1.15)
Receiving course materials via the World Wide Web impedes my studies, because I get distracted through exploration.	2.36 (1.03)	1.88 (1.27)
Using the World Wide Web impedes my studies, because I get distracted through "exploration."	3.00 (1.09)	3.47 (1.35)
Considering the potential for distraction that exists with the World Wide Web, it is a poor choice for delivering materials.	3.15 (.88)	3.58 (1.10)
I have NO difficulties corresponding with the instructor through e-mail.	3.33 (1.07)	3.67 (1.54)
The inability to readily discuss course materials with the instructor hindered my ability to learn.	2.91 (.69)	3.15 (.98)
The benefits of accessing course materials via the World Wide Web (i.e. professional graphics, instructor's exact notes, and multimedia presentations) outweighed the time cost.	2.88 (.86)	3.06 (1.27)
I have access to appropriate computer equipment when needed	2.94 (1.35)	2.88 (1.51)
I DO NOT have the necessary training to obtain course materials delivered via the World Wide Web.	3.03 (1.31)	3.68 (1.22)
Delivery of course materials via the World Wide Web helps me become more comfortable with computers	2.24 (.87)	1.91 (1.07)
I am willing to take a course that delivers materials via the World Wide Web.	2.67 (1.16)	2.47 (1.44)

Note. Scale: 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree. Standard Deviations are in parentheses.

Table 2.
Differences Between Pretest and Posttest Perception Scores for All Students (N = 35)

Item	Assessment	Mean	SD	t-value	P
Accessibility of course materials	Pretest	1.79	1.14	2.77	.01
	Posttest	1.55	.94		
Receiving course materials time consuming	Pretest	2.36	1.03	2.32	.03
	Posttest	1.88	1.27		
Get distracted	Pretest	3.00	1.09	-2.48	.02
	Posttest	3.49	1.35		
Poor choice	Pretest	3.16	.88	-2.52	.02
	Posttest	3.59	1.10		
Necessary Training	Pretest	3.03	1.31	-3.28	.00
	Posttest	3.67	1.22		

Note. Scale: 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree.

A paired t-test procedure was used to assess differences between pretest and posttest perceptions of Penn State students of the World Wide Web. Statistically significant differences were found regarding students' perceptions about the use of the World Wide Web to deliver instructional materials before and after participating in the course. Pretest and posttest perceptions differed on problems with accessing course materials ($t = 2.30$), negative influences of the World Wide Web on learning ($t = -2.14$), and the adequacy of training for using the Web ($t = -2.61$). There were differences also regarding changes in level of comfort with the Web after participating in the course ($t = 2.11$).

Table 3.
Test for Differences Between Pretest and Posttest of Perception Scores for Penn State Students (N = 26)

Items	Assessment	Mean	SD	t-value	P
Course materials	Pretest	1.88	1.24	2.30	.03
	Posttest	1.64	1.04		
Hindered learning	Pretest	2.83	.76	-2.14	.04
	Posttest	3.17	1.01		
Necessary training	Pretest	3.16	1.38	-2.61	.02
	Posttest	3.64	1.32		
More comfortable	Pretest	2.32	.85	2.11	.04
	Posttest	1.88	.97		

Note. Scale: 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree

Statistically significant differences were found between Rutgers students' pretest and posttest perceptions of the use of the World Wide Web to deliver instructional materials before and after participating in the course. Pretest and posttest perceptions differed on whether or not accessing course materials on the World Wide Web was time consuming ($t = 2.55$), how distracting the World Wide Web can be ($t = -2.55$), and whether or not students thought the World Wide Web was a poor choice for course materials delivery ($t = -2.65$).

Table 4.
Test for Differences Between Pretest and Posttest of Perceptions Scores for Rutgers Students (N = 8)

Item	Assessment	Mean	SD	t-value	P
Time consuming	Pretest	2.75	.89	2.55	.04
	Posttest	1.63	1.41		
Get distracted	Pretest	3.00	.93	-2.55	.04
	Posttest	4.13	.99		
Poor choice	Pretest	3.13	.84	-2.65	.03
	Posttest	4.13	.99		

Note. Scale: 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, 5 = Strongly Disagree.

Conclusions

Penn State and Rutgers students' perceptions toward the use of the World Wide Web for instructional delivery were overall favorable, with agreement or undecided perceptions on the benefits. As with any new medium, some of the problems discovered by the overall group from both universities involved facility concerns. Although the overall T-tests discovered problems with necessary training and time needed for downloading course materials, many concerns developed at the Rutgers site, due to networking difficulties. Students at the Rutgers site indicated displeasure with the World Wide Web as a delivery method, since its "firewall" postponed download time. This trait may be the reason Rutgers students had significant T-test scores on the "time consuming" and "poor choice" survey items. Although a lesser concern, but an important one, Penn State students expressed a greater need for advance training. Additional T-test results presented by Penn State students noted that easy access to course materials and the increased comfort level of computers were benefits of the delivery medium.

Recommendations/Implications

The purpose of this study was to assess changes in student perceptions of the World Wide Web for deliveries of course case studies. In consideration of the low population of the study, a census was used for data collection purposes. Therefore, the researchers realize that the population in this study may or may not represent all students. As a result, the findings of this study should be limited to agronomy students that were enrolled in this course at Rutgers and Penn State universities.

Although students may not be interested in using the World Wide Web for instructional purposes initially, their perceptions can be altered by their experiences with the medium. In future courses delivering materials through the World Wide Web, it is suggested all students have high-speed access from campus lab sites. As suggested in this study, students will not participate in the activity if it is time consuming. Consideration of the advantages that students receive through this chosen delivery method (i.e. ease of course material access, increased comfort with computers) should be built upon early in the design of the course and used to enhance the course. Furthermore, instructors should be cognizant when using this medium, that the learning experience is positive and rewarding for students.

Recommendations for Future Study

1. Future studies should examine the efficacy of Case-based delivery through the World Wide Web. Additionally, the researchers should be cognizant that all potential sites receive information at equal download speed times.
2. Studies should investigate increase (if any) in computer skills by students participating in Web-based courses.
3. Researchers should investigate the efficacy of instruction using the new Web-authoring tools, such as WebCT and FirstClass.
4. Future studies of Web-based delivery methods should include qualitative analyses to determine specific trends and concerns of students enrolled

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