TECHNOLOGICAL APPROACH TO BUSINESS EDUCATION: WEBCT APPLICATION

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ABSTRACT

WebCT has attracted the attention of many individuals around the world, including that of educators and trainers. Despite all the interest, there has not been much research to support claims for the effectiveness of WebCT instruction. This study provides evidence that WebCT is an effective learning and teaching instrument that brings several dimensions together including interactive, collaborative and critical learning techniques. This study finds that WebCT provides an effective learning environment for students with different learning styles and creates numerous benefits for many diverse groups including nontraditional, physically impaired or disabled, or culturally deprived students.

INTRODUCTION

Technological developments like the World Wide Web, CD applications, WebCT, and other multimedia tools are new means for teaching and learning. The compelling evidence shows that with the advancement of instructional technology in education the teaching duties in higher education are changing. For example, in business education, technology instruction has become an integral part of the instructional process. Its goal has been to create learning environments that are flexible, dynamic, and capable of

responding to a wide variety of individual needs and learning styles through the use of advanced media techniques. There is no denying that Web-based courses open new educational access to nontraditional and geographically dispersed students. The online setting provides a level of flexibility and convenience not provided by traditional classroom courses. However, effective Web-based teaching requires responsible and motivated students whose aims are to learn and enhance their cognitive reasoning.

Recently, business students have been expected to become comfortable with the new network-based global economy. Businesses are hoping that one way to learn about the new world economy is from recent business school graduates. To educate the business student about the global network economy it is desirable and logical that the student's education, at least partially, utilize network-based technology. WebCT allows students to become familiar with network technology and learn their traditional material in an interactive online environment. In fact, WebCT is used by more than 2,500 institutions in 81 countries, and is available in 10 major world languages. It is currently used by The French National Center for Distance Learning, the Japanese National Institute of Multimedia Education, and two Australian territories (WebCT, 2002).

This paper discusses how to embrace technological tools in the name of modernity, efficiency, and effectiveness through the development, structure, and use of WebCT in teaching business courses. In this paper we illustrate how the use of WebCT can contribute to cost-effectiveness of learning, bridge the gap between the textbook and other learning resources, and improve the quality of the students' learning outcome. In particular, we examine the areas of critical thinking, problem solving, decision-making ability, aptitude for detail, oral and written communication, knowledge of information, and ability to organize and analyze. The increasing dependency of business education upon WebCT instruction seems inevitable, because it helps meet the needs of students for greater individualism of instruction and greater relevance of subject matter in a more global, competitive, and challenging business world.

LITERATURE REVIEW

Higher education has begun to respond to the challenges of the new instruction paradigm in part by developing a strong technology component. Availability of an improved infrastructure and an increasing variety of course development tools encourages faculty to develop online or WebCT courses. New aspects of online and WebCT instruction are directed toward improving learning by reducing time, labor, and costs. The most attractive benefit to faculty members is a technological instrument that improves the quality of their teaching and the cognitive learning of their students. Green (1997) conducted a survey and reported that a growing number of faculty across all types of institutions and disciplines employed a wide variety of technologies in college courses. Substantial one-year increases can be found for e-mail, Internet resources, CD-based materials, multimedia, and other technology-based course applications. The author also observed that instructional technology has not radically transformed classrooms or the instructional activities of most faculty of higher education. It appears that an increasing number of faculty use technology to supplement traditional instruction (Kemp et al., 1994). The fuller integration of technology into college classrooms provides learning outcomes similar to those that were created by the introduction of cooperative, collaborative, or other active learning techniques into traditional teaching settings (Shotsberger, 1996).

The changing learning environment caused by advances in technology creates conditions conducive to learning, engages students actively in their learning processes, and allows the instructor to adjust teaching strategies as needed to facilitate subject mastery and professional growth. However, instructional technology skills are necessary to integrate technology into the teaching-learning process and to facilitate the individual, active, and collaborative learning strategies. As shown in Table 1, collaboration and cooperation, problem solving, and critical thinking are important skills in various approaches that can be used in instruction.

Table 1: Comparison of Different Paradigms of Instruction		
Traditional-Teacher Directed	New-Learner Centered	Technological-WebCT
Didactic teaching	Student exploration	Online instruction
Short blocks of instruction	Extended blocks of multi-disciplinary instruction	WebCT application
Passive or one-way modes	Active and interactive modes	Web-based learning
Individual effort	Collaborative/Cooperative	Individual/Collaborative /Cooperative
Teacher as knowledge provider	Teacher as facilitator/guide	Teacher and WebCT resources as facilitator/guide
Ability groups	Heterogeneous groups	Heterogeneous groups
Knowledge/Skill Assessment	Knowledge/Skill and Cognitive	Knowledge/ Skill and Cognitive
	Performance Assessment	Performance and Interactive Assessment

In contrast to traditional classrooms that are space bounded, WebCT extends the boundaries of learning, so that learning occurs in the classroom, from home, and in the workplace. Having permanent access to a multitude of learning resources regardless of one's geographical location allows continuity in learning and encourages uninterrupted learning process (Shotsberger, 1996).

WebCT provides interactive support and guidance via both synchronous and asynchronous communications among students and instructors. Under the new system, the instructors serve as facilitators by providing support, feedback, and guidance. WebCT instruction facilitates learning activities that address all students' learning styles by incorporating

a variety of multimedia elements, such as text, graphics, audio, video and animation (Hiltz, 1994; Jonassen, 1996; Wilson, 1995).

Kearsley (1996) argues that WebCT is easily available and provides a variety of materials so that learning becomes more relevant for all diverse learners. He shows that the Web provides an easy mechanism for electronic publishing where both students and instructors can publish their work to a global audience. For example, the posting of students' projects, papers, and other student work may be used for modeling, discussion, or review. McManus (1996) states that this rapid access to resources can promote higher levels of student involvement and motivation. Interactive peer reviews from the global educational community can also be a powerful motivating force leading to improved effort and self-esteem of students (Robin et al., 1996; Schmitt, 1998; Kearsley, 1996).

WebCT can be employed to promote experiential learning or learning "on site' so that the process of learning is integrated with the real world. While traditional instruction may discourage social interaction, WebCT is designed for collaboration and interaction that can be effectively employed toward critical and reflective learning. This type of social interaction also fosters a greater sense of accountability among the students. The ability of the faculty and students to communicate privately or collectively leads to a new dimension and design of instructional strategies (Schmitt, 1998).

It should be noted that the rich environment of WebCT promotes study and investigation within authentic, realistic, meaningful, and information-rich contexts. It encourages the growth of the student initiative, decision-making, and broad-based learning. Finally, it cultivates an atmosphere of cooperative learning among students and promotes critical thinking processes (i.e. analysis, synthesis, problem solving, experimentation, and creativity) to help students integrate new knowledge (McManus, 1996).

AN INSTRUCTIONAL DESIGN FOR TEACHING WEBCT BASED COURSE

By using WebCT we address the following teaching and learning issues: (1) enable students to take more active roles in their learning processes; (2) provide interaction among students and instructors; (3) present course material in ways that recognize a variety of learning styles; (4) make a greater array of resources available for students; (5) make those resources available inside and outside the classroom; (6) provide exercises and experiences that promote the development of higher-order cognitive skills.

WebCT provides unlimited opportunities for addressing the development of a variety of skills such as analytic, problem solving, drawing reasonable inferences from observations, synthesizing and integrating information, thinking holistically, creatively, and critically and being able to distinguish fact from opinion.

The course is structured around readings and supplemental lessons posted on the class WebCT. Course readings include materials provided by the publisher and the instructor. The publisher supported WebCT material contains text chapters, quizzes, chapter reviews, exams and on-line articles. The instructor's material includes PowerPoint presentations, assignments, homework, sample examinations, quizzes, bulletins, and instructors feedback on homework and class assignments.

Instruction is conducted via regular classroom lectures. Learning on WebCT is conducted via Web-based discussion groups and posting or reading materials or comments via Web chat areas. We assume greater roles as planners, designers, guides, mentors, and facilitators and have to be willing to relinquish our traditional roles as providers of content material. We have to be technologically literate as we use WebCT technology. With our involvement we focus on developing higher-educational cognitive, reflective, critical, creative thinking, and problem solving skills.

Based on our experience with the use of WebCT, students who use WebCT assume greater responsibility for their own learning and are more willing to communicate and share their results with others. They are able to develop and practice the skills necessary for cooperation and collaboration

with others. They become familiar with how to use WebCT technology in order to use available resource to complement their learning. For example, skills in writing are enhanced as students examine journal articles and transcribe their reports on bulletins.

WebCT improves test presentation and standardization, offers enriched display of information, provides increased variety of testing forms, provides equivalent scores with reduced test time, reduces measurement error, provides improved scoring and reporting, and gives immediate feedback to both students and faculty. It also provides simple mechanisms for storing and retrieving valuable information and allows the instructor to easily tailor tests.

ASSESSMENT OF TEACHING EFFECTIVENESS

Student learning is a fair and objective way to assess the effectiveness of teaching with WebCT. Evidence of what students learn is important for instructional and course improvement. When student evaluations are used for instructional improvement, the detailed diagnostic items and written comments can lead to improvement in the teaching techniques used by instructors. The use of other methods of evaluation to assess teaching effectiveness can be applied in conjunction with current methods to form a more comprehensive model of faculty evaluation. The primary objectives of this study are to learn about student attitudes and practices regarding WebCT and to examine their learning performance.

In order to evaluate student learning and instructor teaching effectiveness via WebCT we conducted a student opinion survey.

WebCT Student Opinion Survey

This questionnaire is being sent to selected students to learn about your attitudes on using WebCT and to offer suggestions for its improvement. For your convenience, most of the questions in this questionnaire require a mark (●), or for you to circle a number under the appropriate answer. Your responses will remain strictly confidential and only aggregate data will be analyzed. Thank you very much for the time and effort that was necessary to complete this survey.

1. How often did you participate in the following WebCT activities?

Activity	Most Often ←----------		Somewhat Often ----------	Least Often ----------→	
Communication: Mail	1	2	3	4	5
Communication: Bulletins	1	2	3	4	5
Communication: Chat	1	2	3	4	5
Course Content: from professor	1	2	3	4	5
Course Content: from publisher	1	2	3	4	5
Tests/Quizzes: from professor	1	2	3	4	5
Tests/Quizzes: from publisher	1	2	3	4	5
Course Calendar	1	2	3	4	5
Syllabus	1	2	3	4	5
Progress Tool	1	2	3	4	5

2. Please indicate your satisfaction with the following WebCT tools:

Communication: Mail	1	2	3	4	5
Communication: Bulletins	1	2	3	4	5
Communication: Chat	1	2	3	4	5
Course Content: from professor	1	2	3	4	5
Course Content: from publisher	1	2	3	4	5
Tests/Quizzes: from professor	1	2	3	4	5
Tests/Quizzes: from publisher	1	2	3	4	5
Course Calendar	1	2	3	4	5
Syllabus	1	2	3	4	5
Progress Tool	1	2	3	4	5

3. Please indicate how the use of WebCT influenced each of the following skill areas:

Critical thinking					
(1) from professor	1	2	3	4	5
(2) from publisher	1	2	3	4	5

WebCT Student Opinion Survey					
Problem solving					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
Decision making ability					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
Aptitude for detail					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
Oral communication					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
Written communication					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
Knowledge of information					
a. from professor	1	2	3	4	5
b. from publisher.	1	2	3	4	5
Ability to organize/analyze					
a. from professor	1	2	3	4	5
b. from publisher	1	2	3	4	5
4. Please indicate your level of agreement with the following statements:					
WebCT stimulated my intellectual efforts beyond that required by most other courses within:					
a. division	1	2	3	4	5
b. college	1	2	3	4	5
c. university	1	2	3	4	5
WebCT helped me develop more professional respons-ibilities (self-reliance, self-discipline) than most other courses within:					
a. division	1	2	3	4	5
b. college	1	2	3	4	5
c. university	1	2	3	4	5

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WebCT required me to work harder than most other courses within						
a.	division	1	2	3	4	5
b.	college	1	2	3	4	5
c.	university	1	2	3	4	5
WebCT helped me develop better technological skills & competencies than other course within:						
a.	division	1	2	3	4	5
b.	college	1	2	3	4	5
c.	university	1	2	3	4	5
5.	What could be done to improve this WebCT course?					
6.	What is your major? [ ] accounting [ ] economics [ ] finance [ ] marketing [ ] management [ ] information systems [ ] other					
7.	What is your class status? [ ] senior [ ] junior [ ] sophomore [ ] freshman [ ] other					
8.	What is your work status? [ ] full-time [ ] part-time [ ] do not work					
9.	What is your student classification? [ ] traditional [ ] nontraditional					
10.	What is your gender? [ ] male [ ] female					
11.	How many WebCT courses have you taken? [ ] 1-2 [ ] 3-4 [ ] 5-6 [ ] 7 or more					

WebCT Student Opinion Survey

12. Which one of the following reasons best explains why you selected this WebCT course?
[ ] my previous experience with WebCT was favorable
[ ] my friend (s) recommended it
[ ] my faculty advisor recommended it
[ ] my professor (s) recommended it
[ ] it was convenient for my schedule
[ ] other

STATISTICAL ANALYSIS AND RESULTS

The data were collected at the end of the spring 2002 semester. Each student was given the same feedback form - questionnaire - in which they had to select one of the several ordered categories. The survey addresses the students' opinions regarding the use of WebCT. Survey participants, students of business courses, were selecting one of the five ordered categories (see assessment instrument in Appendix One) to evaluate how strongly (if at all) the method of instruction influenced each of the skill areas: critical thinking, problem solving, decision making ability, aptitude for detail, oral communication, written communication, knowledge of information, and ability to organize and analyze. By studying the discrepancies in their evaluation we are able to study the impact of the WebCT on the pedagogical performance.

After converting the data into the "differences" representing the shift between categories selected on both occasions, we noticed that these "differences" were either 0 or 1, sometimes two or more categories apart. We looked at these differences from two perspectives: (i) perspective of a particular student - is shift magnitude randomly distributed, or is there a certain pattern?; and (ii) from the perspective of a particular skill area: are all skill areas influenced by the use of instructor provided WebCT in a similar way or is there an indication that it varies?

We used the data to see in how many skill areas a particular student had seen an improvement when taking the course with instructor prepared WebCT component. Such cases correspond to a positive shift and occurred with the frequencies given in the Table 2.

Table 2									
Numbers of Students Who Noticed an Improvement in a Particular Number of Skill Areas									
Category	0	1	2	3	4	5	6	7	8
Number	35	4	11	8	11	11	6	10	4

Based on results reported in Table 2, we conclude that the most frequent group is the group of students who did not feel they benefitted in any area (35% +/- 9%). The distribution of students who benefitted in at least one skill area does not express any particular trend or pattern, and a test of its uniformity came out non-significant (chi-square = 8.23, 8 df., P-value =0.021). The variation in the other group is due to randomness. This result is very interesting. The data we collected are based on subjective judgment, and it seems that it is not the problem of the technology not being the adequate teaching tool, but the problem of students not being quite ready for it. We will examine this aspect in our next study by including questions designed to evaluate the degree of student familiarity with Internet resources, and with computers in general. Also a trend over time may be studied.

To compare the skill areas from the point of view of the magnitude of the improvement we summarized the data in the Table 3. For each of the 8 skill areas we obtained the frequencies of students who either did not notice any improvement (0), noticed some improvement (shift by 1 category), or noticed strong improvement (shift by 2 or more categories).

A Chi-square test for homogeneity was performed (chi-square = 26.714, 14 df, P-value = 0.021) in order to compare distributions among all skill categories. According to our results, significant standardized residuals were all moderate except one. Twelve students reported strong improvement in the ability to organize and/or analyze with using WebCT technology. That is more than expected. The possible explanation is certain elements of the WebCT instrument allowed students to better organize their work via the use of WebCT calendar, lecture notes, course content, etc.

Table 3			
Distribution of the Magnitude of Change for all Eight Skill Areas			
Skill Area	0	1	2 or more
Critical thinking	61	35	4
Problem solving	70	28	2
Decision making ability	67	29	4
Aptitude for detail	71	24	5
Oral communication	73	23	4
Written communication	57	39	4
Knowledge of information	68	23	9
Ability to organize and analyze	56	32	12

The other differences are not significant and are due to random variations. By combining the data related to the first seven skill areas: critical thinking; problem solving; decision-making ability; aptitude for detail; oral communication; written communication; and knowledge of information, we can obtain an estimate of the common proportion of improvement (regardless of the magnitude) by using WebCT technology is 24.6% +/- 3.2%.

CONCLUSION

The widespread availability of WebCT allows instructors to make greater use of available Internet technologies. By using WebCT, instructors can assume the roles of counselors, guides, and mentors. They are able to spend more time planning and facilitating learning and developing higher order skills and less time presenting content. With the technological capabilities available via WebCT, students are able to take more responsibility for their own learning. They assess information from more resources than are available from just a single instructor or a single textbook, and can now easily collaborate with their fellow students.

WebCT-based courses typically include lessons, modules, lectures, readings, assignments, quizzes, tests, and other instructional materials that serve as learning resources. While many students are initially reluctant to embrace the use of WebCT, they eventually become very satisfied with the technology, because it requires significant interaction among students and instructors both inside and outside the classroom.

An important advantage of using WebCT relates to the development and design of course material by the instructor. It enables faculty to extend teaching and learning opportunities by combining features of communication, passive and active learning, and independent and group experiences. WebCT is widely accessible and provides a variety of materials so that learning becomes more relevant for various learners, provides numerous benefits to nontraditional students, and can even be delivered to those who are physically impaired or disabled or culturally deprived.

As the use of network-based technologies increases in business and as the phrase "international business" becomes more and more redundant, the use of online learning systems such as WebCT becomes especially critical to multinational organizations. WebCT allows interactive learning, letting the employees decide when they will learn, instead of the geographical-and-time-schedule constrained traditional university. Because the new global employees are constantly on the move, the multinational firm could have difficulty keeping its workers current in their knowledge and skills.

Based on the result of the survey, it can be argued that WebCT has the potential to make significant improvements in teaching and learning. WebCT instruction improves quality through better access to useful information, improves instructional delivery and organization, and provides alternative means for student interaction and improvement. The combination of the WebCT instruction, the course objectives and instructional organization determines the effectiveness of business education and instructional development in higher education as required by national accreditation agencies.

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Table 1: Introduction Section of Course Syllabus

OB, Inc.: MGNT3250, ORGANIZATIONAL BEHAVIOR AND MANAGEMENT
Spring Semester, 2001

Organizations are increasingly moving toward group- or team-based designs, where teams of employees assume more responsibility for their own performance. Companies such as Volvo, Quad-Graphics, Delco, Northern Telecom, Saturn, and Honeywell have reported tremendous success and turnarounds which they attribute in large part to employee teams. Organizations who have not adopted team-based work designs have increasingly employed other forms of individual employee participation and involvement.

There is also a growing body of empirical evidence that learning is enhanced by student involvement in the design of the learning experience. Individuals learn in different ways, which makes a single course delivery system (e.g., lecture) ineffective for at least some students. This course is designed around and based on this empirical evidence, and the following assumptions:

1. Employee/student participation in decision making generally results in more accurate decisions.
2. Employee/student participation in decision making generally results in more commitment to making those decisions work.
3. Employee/student responsibility for their own performance and results generally leads to higher motivation and performance.
4. Individuals differ in how they learn most effectively and therefore require different instructional/learning methods.
5. Different instructional/learning methods require different methods of assessment and evaluation.

MGNT 3250, hereafter referred to as OB, Inc., is a non-traditional course in Organizational Behavior and Management. It is based on the idea that the traditional lecture is an effective course delivery method for some students, but ineffective for others. In addition, since organizations are increasingly employing team-based work designs rather than more traditional individual job assignments, this course will provide students with an opportunity to gain skills in working in teams. Primarily, this course will enable you to select and design the learning and instructional methods most effective for you. The Instructor's role in this course is similar to the role of a manager or supervisor in a self-managing team; that is, as a resource. Individuals and/or teams may call on the Instructor to provide lectures, explanations, descriptions of assigned material and to design evaluation methods.

Table 1: Introduction Section of Course Syllabus Continued

GRADING

You must reach an agreement on how your performance will be evaluated for each work period with the instructor. Once this agreement is made it may not be changed during that work period. It may, however, be changed for the next work period. You may choose to work as an individual or in a self-managing team. Regardless of the method you choose, you must reach agreement with your instructor as to how your performance will be evaluated by the second day of that work period.

Evaluation Methods

You may choose any reasonable method by which to have your performance evaluated. For example, if you prefer to work as an individuals and prefer traditional methods, you may ask the instructor to lecture to you on the assigned material and administer a variety of forms of examinations. If you decide to work in a self-managing team, you may still ask the instructor to administer an examination to you, or you may make presentations to the instructor, write papers, ask the instructor to verbally ask you questions about the material, or any other reasonable method by which the instructor can assess your understanding of the assigned material. THE ONLY REQUIREMENT IS THAT YOU MUST DECIDE ON A METHOD BY WHICH THE INSTRUCTOR CAN ACCURATELY ASSESS THE LEVEL OF UNDERSTANDING OF THE MATERIAL OF EACH MEMBER OF YOUR GROUP. That is to say, one group member may not carry other group members...everyone's performance must be assessed. The assessment method chosen must permit determination of differentiation in levels of student performance. You must reach agreement with the instructor about how your performance will be evaluated by the second day of each work period.

All students must take a 50 question multiple choice midterm and a 50 question multiple choice final examination on the day scheduled by the university for this course.

WORK RULES

OB, Inc. has some common work rules.

1. You have 5 personal days that you may use at your discretion. These must cover all illnesses as well as any other types of absences. The 6th absence costs you one letter grade. The 7th absence results in an F for the course.
2. Self-managing teams who find they have a non-performer, must manage this problem during the current work session. Teams may change their membership at the end of each work period. If you are fired from a team, you are responsible to perform the work during the next work period individually, or gain membership in another team.
3. YOU MUST NOT BE ABSENT DURING AN ASSIGNED EVALUATION OF PERFORMANCE....IT IS NOT POSSIBLE TO "MAKE UP" EVALUATIONS.

ECONOMICS ARTICLES