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Web-Based Teaching and Learning in E-Commerce

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WEB-BASED TEACHING AND LEARNING IN E-COMMERCE

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Abstract

Technology is the means by which our education system is teaching in colleges and graduate schools today in the classroom. Web-based teaching and learning has made it capable for teachers to interact with students on an academic level, and enhance the learning process at the same time. The web-based tools provided for teaching and learning has improved over the years, which resulted in self-motivation among students, and better staff development among teachers. The idea for web-based teaching and learning to implement successfully is for teachers to provide feedback to the students on their assignments and academic progress in the classroom. The purpose of this paper will be to focus on the past and present of web-based tools in e-commerce; and how they are helping to enhance the teaching and learning of colleges and graduate schools today in the classroom.

Keywords: web-based teaching and learning, teachers, students, classroom, computer-based training

Introduction

Web-based teaching and learning in e-commerce has been a major influence on education among teachers and students for many years. College campuses and graduate schools have been using web-based tools that help students develop better critical thinking skills, and enhance their learning at the same time. These web-based tools have led to the development of Web-based training (WBT) software, such as QUASI and WebCT, to be used in the classroom with efficient results. Though web-based tools have been used for quite some time, it was not until recently in the last few years that WBT software and new technology was implemented in the college/university setting. The results from this have led to effective internal communication and higher quality education among teachers and students. This paper will demonstrate the use of web-based tools for teaching and learning, and how web-based teaching and learning in e-commerce will be the way schools implement WBT software in their classrooms for educational purposes.

Web-based tools

It is said by educators that if you want to have learning take place in the classroom, the teacher should create a situation in which students are allowed to engage in some kind of activity or communication process (2004). In simpler terms, the students should receive particular feedback to their personal input, or interact with other students or teachers. When web-based teaching and learning was introduced to education, the idea for teachers and students to interact with one another and provide each other feedback was difficult to achieve, and considered impossible by many teachers. However, within the last

few years, technological advances were implemented such as the JAVA programming language that produced a number of tools, which has made it easier for teachers to perform what we now know as Computer Mediated Communication (CMC) (2004).

The JAVA technology is "a portfolio of products that are based on the power of networks and the idea that the same software should run on many different kinds of systems and devices" (JAVA Technology, 2004). JAVA provides the use of CMC tools among teachers and students in the classroom. In the past, the early CMC tools such as e-mail, mailing lists, and newsgroups did not have the impact on teaching and learning than originally expected. The reason is mainly due to the user interfaces that the teachers and students have been associated with for quite some time. Today, the Web now provides an intuitive interface with the CMC tools and other tools, which provide better conditions for teaching and learning.

Web-based discussion tools

The web-based discussion tools can support teaching and learning activities in different ways. For instance, there is one-to-one interaction (e-mail), many-to-many interaction (conferencing), and one-to-many interaction (bulletin board) among students and teachers given the preference in the classroom (2004). This is especially helpful when used for asynchronous communication because it allows students and tutors to communicate with each other without restriction in terms of time and place. It can also be a positive influence on enhancing student participation in class discussions as well as students facilitating collaborative work such as group projects (2004).

The web-based discussion tools can also provide the use of a synchronous communication facility known as chat rooms, in order to promote a more relaxed atmosphere for communication. Other facilities provided for by web-based discussion tools include: user control, threading system, uploading of files, archiving, and e-mail notification and mailing list broadcasting. The user control controls the actual entry into the discussion, whether it should be open or closed to guests online (2004). The threading system is the method by which messages can be retrieved through the discussion. Uploading of files allows users to exchange documents and files of different formats without having to distribute them to all members of the group. Archiving is the recording of all contributions in a discussion, and the e-mail notification and mailing list broadcasting controls the postings to the discussion and can allow the use for off-line discussion through e-mail when appropriate (2004).

Virtual Learning Environments (VLEs)

Another type of web-based tools is called Virtual Learning Environments (VLE's). VLEs are web-based tools designed to support, manage, and in some cases, replace the traditional teaching and learning process within one single software environment (2004). The ability to develop and use Web-based training (WBT) software would be imperative for a VLE to be successful. The VLE provides three different user levels – student, tutor, and administrator – with each level allowing more access to the environment. The VLE can offer a combination of the following facilities: the delivery of course materials and information; student-tutor and student-student communication tools. Student self-assessment and automated feedback, as well as tutor monitored automatic marking (CAA). Student progress tracking by tutors; individual and group profile statistics and management; support tools such as electronic diaries and calendars; collaborative group work areas, cross modular access and information sharing facilities; personalized note-taking and printing; and local and remote access; browser access and access to on-line materials; off-line access for students with connectivity problems (2004). The VLE should allow the ability to share information with other universities, as far as their username and password authentication file systems are concerned. Some universities decided to open up their own VLE internally, though it is considered a costly option. One main problem with VLEs right now is the lack of compatibility between systems. This is because the materials produced and managed in one system are not easily transferred to or read by another (2004).

One perfect example of a VLE is the QUASI system developed by Kevin Boone of Middlesex University in London. QUASI stands for 'Question-Answer System for the Internet', and is considered by Kevin Boone to be the first fully Web-based online assessment system in which exercises could be authored by non-specialists using only a Web browser (2003). The QUASI system is a computer-aided assessment system, which allows a 'non-specialist' tutor to design sets of questions that will be presented to a student by the medium of a Web browser. The students answer the questions, and receive feedback and a score. The exercises can be set by Web browser forms, or by writing text files in a well-documented format. QUASI supports multiple choice, true false and 'click the image' questions, as well as free-form text entry (2003). QUASI can also incorporate a pattern-matching strategy to classify free form answers according to templates supplied by the tutor. Though Kevin Boone believes it is obsolete from technology now, the system is still in use in many universities and outperforms other products for Web-based assessment in a number of areas (2003).

Kevin Boone wanted to focus on other areas of assessment that related to coursework submission and detecting plagiarism. He decided to create a VLE that would allow students to submit their coursework assignments, or computer programs, for marking online in the form of a World-Wide Web page (1999). The goal for this particular VLE would be to eliminate the hassle of collecting and re-distributing coursework in groups of students where there is traditionally a high incidence of plagiarism and late submission. In addition, the time saved from the hassle can be used to provide feedback and advice to students on their academic progress in the classroom. At first, Boone experimented with the use of e-mail for students to submit their coursework assignments. He later realized that e-mail is not an effective mechanism for submission because there is no way to confirm the delivery of the assignments, and some students would forget to put their names or identification numbers on their work. The e-mail accounts of students are not easily traced back to them, as Boone soon figured out, and to handle such "accidents" allows more work to be done to the teacher (Boone, 1999). This is how Boone came up with the idea that using a Web-based system overcomes these problems and provides a more useable interface, including on-line help for the students in case they are stuck on the coursework or cannot submit their assignment. The on-line help will inform the student immediately if the work cannot be accepted for any reason, and explains how to put it right on the Web page (1999).

Boone tested the VLE out on a group of 66 students, ranging from ages 22 to 50 (1999). The students would go to a Web page, identified in lecture or the course handbook, and read the details of the exercise that needed to be completed. Below the exercise is an 'answer' area that the student's submission must be written, and spaces for the student's personal information such as name, e-mail, ID, etc. After the student is done, he or she will click the 'submit' button, and their submission is delivered to a central data storage area. If the submission is accepted, he or she will be issued a 'receipt code,' which identifies the student and the time and date of submission. If the submission is not accepted, then the student is politely informed of the reason and asked to re-submit. The tutor who handles the submissions can access the system via the World-Wide Web (1999). The system will allow the tutor to select some or all of the submissions, using various search criteria. Once the tutor selects the submission, he or she will see the submission in the Web browser with the student's name, ID number, and e-mail address. The tutor can then cut-and-paste the submission into an e-mail program where comments can be added and sent directly back to the student (1999).

The results were very favorable among the students and Boone. There were some minor discrepancies among students such as illness and pressure, but overall, the VLE turned out to be very successful for the students and tutors. Boone discovered that there was less plagiarism involved and late submission is lower than in previous cases. This is because on a Web-based submission system, there is no ligancy among students. The submission has to be done at that particular moment and the student will have to keep re-submitting until it is accepted by the system. Boone believes the paper-based system would not be as efficient because the students can take advantage of the academic and get away with a lot of slack. In addition, with a paper-based system, it is not easy to detect plagiarism so quickly. Boone created an effective VLE that is widely recognized among universities today. With an influence such as Kevin Boone, there is no reason why universities should create their own VLE internally from within their own atmosphere.

Design Issues with Web-based Tools

While it is imperative for web-based tools to work effectively for web-based teaching and learning, there are some design issues to consider when developing these tools for the World Wide Web. The issues fall under the area known as computer-based training (CBT). Unlike web-based training (WBT) software, CBT is the stepping-stone to developing a system for teachers to enhance learning in the classroom online in order to promote self-motivation among the students. In fact, CBT is often considered an "ignored area for development on the World Wide Web" (Meyer, 2004).

The ability for the teacher to teach the student across the globe is a huge impact among web-based teaching and learning, and cannot take place if CBT is not implemented properly on the World Wide Web. The teachers have to take into consideration the impact of the material will have on the students. They need to look into the accountability of the effect new information will have; how much material to introduce at once; and how the visual design is important to the conveyance of information (2004). Once these details are achieved in CBT, the results can lead to better web-based teaching and learning for the teachers that are involved.

The causes and effects of introducing new material

In general, CBT involves two parties: the teacher and the student. The teacher writes the text for the material to be put online and is considered by his or her peers as an expert in the subject about which he or she writes. When he or she is writing the text, the teacher has to consider the reaction of the student to who the material is presented. He or she has to realize that

every piece of new information causes the same effect in the student. Even though the student's mind may be open to new ideas of the particular subject, the process of integrating new information into their set of knowledge requires mental effort. When the student's effort of integrating too much information becomes overwhelming, that is when the learning process will start to deteriorate for the teacher, as well as for the student (2004).

To resolve this issue, the teacher should consider keeping the amount of new information a student handles at one time to a minimum. When the teacher introduces a new concept, he or she should not use new terms unfamiliar to the student unless it is necessary. The teacher has to present new information one step at a time, in order for the student to put the data all together as he or she goes. The teacher needs to understand that new concepts to the student will take time to get used to. If the teacher can make this learning process as simple and painful as possible, he or she will receive some great feedback from the student. If the teacher makes this learning process difficult and complicated, then they will most likely generate negative feedback and low self-motivation among the student.

Visual design

When the teacher is designing a tutorial for web-based teaching and learning, there is only one goal in mind: to convey as much useful information to the student as possible, with a limited number of distractions involved. For this process to take place, it is imperative to not only express ideas clearly, but to also make the presentation of the information inviting to the student. The teacher always has to keep in mind that anything new, whether in the text or not, will be another piece of information the student has to process mentally in their minds. The ability for the teacher to produce a well-constructed tutorial can present all of its new data in the text, leaving the look of the text to be more or less the same throughout the material (2004).

If the teacher decides to use customized conventions or symbols in the text of the tutorial, he or she needs to explain these symbols or conventions to the student before the instructional text has started. This way, it will give the student a chance to get used to the look of the material and then turn to learning the material the teacher is trying to teach. As a result, there is the chance that establishing a consistent look-and-feel to the tutorial will take place among the overall learning process. By doing so, it could mean using the same graphics on every page or being able to employ unusual colors for the text and background. However, whatever the teacher decides to go with, it should not so much make the tutorial memorable as make it visually coherent. Normally, printed material uses the same font, the same layout, and the same arrangement throughout the work. An online work done by the teacher should be no exception (2004). Even though the teacher is capable of making every page different, there is no particular reason why he or she has to produce different designs on every page of the tutorial. Overall, the main concern for the teacher is to avoid confusing the student. The likelihood to have clashing page appearances will lead to confusion among the student. Though the student may not realize it, but the various visual cues that occur on the different pages can cause the student to approach each new page as though it were part of a separate work. Therefore, to have a consistent look-and-feel will reduce the number of new things to deal with to whatever is contained within the text of the tutorial (2004).

When you take a good look at a specific visual design of a tutorial's pages, there is a delicate balancing act, which must be performed among the teacher. If the look of the pages is too boring, then the student will assume that the text itself will be boring as well. However, if the pages are wildly colorful and 'radical', the student will be intimidated into thinking the material will be too hard to understand, or that it will be too hard to read at all (2004). Briefly, the best visual design is one, which looks open and inviting – one that draws the student into the sense that the journey ahead will be smooth and pleasant from hereafter. To obtain this goal, the use of muted color tones, a judicious use of white space, and an informal look have to be implemented into the tutorial by the teacher. Other approaches can be taken by the teacher, but these particular approaches have proven to be time-proven successes among colleges/universities (2004).

Another idea to be considered by the teacher is to leave the tutorial's text and background colors alone, and allow the student's preferences to determine these settings. This way, the student is presented with whatever color scheme he or she is most comfortable with – otherwise it would not be his or her default setting (2004)! By taking this approach, the visual consistency is enforced dramatically by using a similar graphic element such as a logo or other symbol, or even a certain placement strategy. On a similar note, to change the look of the pages as the text progresses will keep the students off balance, which is not the goal of the teachers in designing the tutorial. Overall, humans can take a change in appearance to mean a change at more fundamental levels. For the students, their mindset becomes 'The look changed, so there must be bigger changes afoot, like a new teacher' If this occurs, then the teacher will eventually destroy whatever rapport he or she has built with the student, and can damage the foundation that the previous text has been laying down for the learning process (2004).

Visual design is very important when developing web-based tools. It can make or break the education of students in the classroom. An issue such as visual design is something to be taken very seriously among the teachers, because whether it is

the text or the background, every little detail that is presented in the tutorial has to be looked at very carefully. Whatever decisions are made on the color scheme or the appearance of the material will have an impact on how students process the information they see on the tutorial. To achieve success of the tutorial, the teachers have to discuss all details involved with the visual design on a consistent basis in order to make sure the students will demonstrate effective learning and self-motivation. When the visual design is successful in the tutorial, the ultimate reward will be better staff development among the teachers, as well as better education for the students.

Implementing web-based training software

In the last few years, technology has been updated to the extent that colleges/universities have begun to implement web-based training (WBT) software to increase the student participation in the classroom and achieve better staff development among teachers in a college/university setting. In fact, IBM was one of the first corporations to help colleges and graduate schools introduce the use of technology into the educational setting. The corporation created a program called IBM ThinkPad University in order to help educational institutions become more aware of the need for technology to enhance learning and improve student achievement among the institution as a whole (IBM, 2003). The program took place in the U.S. in the summer of 1995 when IBM issued laptops to students in a small college in Crookston, Minnesota. The purpose was to transform the learning environment into a network environment for all teachers and students to learn and to gain critical thinking skills (IBM, 2003). The program proved to be very successful for the Minnesota College, and IBM then decided to go overseas to help a university in Canada become a better e-learning environment.

Dr. Kevin Ogilvie, President of Acadia University in Wolfville, Nova Scotia, decided he wanted Acadia's students and faculty to have access to educational services at anytime and at anywhere. This vision created Acadia Advantage and with the help of IBM, the university is now able to realize the vision with 4,000 students and its faculty being able to access learning resources and provide better teaching opportunities for faculty in the classroom (IBM, 2003). The IBM ThinkPad University began its program for Acadia in the fall of 1996 with a sample implementation of 500 students. The purpose of the program was for the technology to allow for support and maintenance costs, be able to offer analysis, planning, infrastructure development and implementation services, and facilitate better instruction through better information access and sharing (IBM, 2003). The program leads to the development of Acadia's own learning/management system with the use of Microsoft Office-based tools (web-based tools) and Lotus software in its laptops provided by IBM. The software updates on a continuous basis and the laptops rollover every two years to ensure the technology is current in today's society.

Acadia University also realized the need for WBT was imperative for the faculty in using the technology and creating a cutting-edge educational environment would require significant investments in professional development and support. Therefore, Acadia University created the Acadia Institute for Teaching & Technology (AITT), a critical component of Acadia Advantage, in order to help the faculty discover the most effective ways to use technology to improve teaching and learning (IBM, 2003). The AITT provides the use of training, application development, research, and instructional (pedagogical) leadership in the classroom, and how to implement each concept in teaching and learning. As a result, the students are able to graduate Acadia University with a wide knowledge of computer skills and technology, along with problem-solving capabilities and enhanced communication skills (IBM, 2003).

WebCT

The IBM ThinkPad University program introduced us to the new wave of technology in the educational institution. Along the way, new technology came into place and helped us to understand why web-based teaching and learning is so effective in a college/university or graduate school. For example, a front-end software application known as WebCT, developed to help improve the learning experience in the classroom and, according to the website, "actually transform the educational experience" (WebCT, 2003, p. 1). WebCT is the leader in the 'higher-education e-learning market' and according to its vision, they "will deliver state-of-the-art educational technology that supports a full range of teaching and learning styles and optimizes intellectual and technical resources" (WebCT, 2003, p. 1). To show the effectiveness of WebCT, it is best to look at a couple examples of how WebCT has helped colleges/universities or graduate schools become better e-learning environments.

In one particular example, WebCT is introduced in a 'problem-based learning, student-centered curriculum' called *Curriculum 2001* at the Nelson R. Mandela School of Medicine in South Africa in January 2001 (McLean & Murrell, 2002). The 'curriculum' consisted of approximately 200 students from diverse backgrounds and educational experiences who have not had the chance to use technology such as WebCT. The reasons why WebCT was chosen for *Curriculum 2001*was due to its low cost, its easy integration for supporting new learning technologies, its special facilities such as private e-mail and a

bulletin board, and the ease of updating and expanding its software on a consistent basis. Other features such as online quizzes and student tracking were added advantages of using WebCT (McLean & Murrell, 2002).

The faculty and support staff spent four days in training in June 2000 to learn every aspect and feature of WebCT. After the training, the students are introduced to WebCT as a means of communication between faculty and students, as well as for delivery of resource material from large group sessions, case studies, etc. during the first of six course modules for the first year of *Curriculum 2001*. For those students who lacked in computer skills, training is offered for up to ten weeks, twice a week, in order to be able to use WebCT on a regular basis. Afterwards, students could use WebCT for the purpose of learning and communication with faculty and support staff (McLean & Murrell, 2002).

The results after the first module showed great interaction between students and faculty, and students themselves. The bulletin board feature was very popular among students to enhance their communication skills in WebCT. Others used the private e-mail to send private messages to one another. A survey conducted among students early in the second module to see how useful WebCT was to them and whether or not they had difficulties with the software as far as logging into WebCT is concerned. The survey showed that approximately 88% of students recognized the value of the resources, while 95% found the ability to access additional information from websites helpful (McLean & Murrell, 2002). The survey also showed that logging into WebCT was not a problem for most students and communication with faculty and staff was a major incentive for the school.

Overall, after the first year of *Curriculum 2001* was over, the school demonstrated that WebCT was a huge success in teaching and learning in the classroom. The communication proved to be the major component of WebCT and students demonstrated high enthusiasm when using the system to communicate with other students. The ability to have access to digital resources for learning purposes, such as PowerPoint presentations and videos, also showed to be popular among students and faculty. The least favorable feature of WebCT among students and faculty was the online quizzes. The reason was due to technical difficulties with the release of WebCT in the beginning. When tests or quizzes became available, students lost interest and nothing happened to help resolve the problem. Another problem dealt with the fact that some students were still getting familiar with WebCT and trying to understand the system because they had never used a computer prior to entering the school. Though the quiz facility was not successful this time, the authors of this study believed that online quizzes do have potential for surveys and assessments down the road when the need arises. The authors concluded that the implementation of WebCT would help students of the Nelson R. Mandela School of Medicine become successful medical parishioners for the future (McLean & Murrell, 2002).

Another example that shows success of WebCT is a study done at Manchester Metropolitan University. The university wanted to develop a "fellowship scheme" in which online teaching materials would be created with the use of WebCT, and then delivered to faculty and students during the 1999-2000 academic year to see how the impact of the teaching and learning affects the online courses (Kendall, 2001). The development team made the decision to use WebCT for the fact that minimal technical experience is required from students and course designers. The team also believed the bulletin board feature of WebCT would allow better communication skills to develop by the students and the faculty. When designing the structure of the course, the team thought it best to divide the course into three parts with assigned dates for each student to complete each part of the course. WebCT allows course materials to be "hidden" from students until a certain date so that the student is not overwhelmed from the system in the beginning and can take interest in the software (Kendall, 2001).

The intention for the first part of the course is for students to use the bulletin board and private e-mail features of WebCT to help implement consistent communication between the student and the staff member, and other students in the course. The second part of the course allows students to use resource material provided through WebCT to help develop their problem-solving capabilities. The third part of the course is meant for students to discuss research they have found through WebCT in online sessions so that they can enhance their critical thinking skills for future use. To help students with this part, they were asked by the instructor to create their own home pages through WebCT, so that when they work together in groups, each student will be able to see what each person brings to the table. To increase the use of group work, WebCT allowed *group forums* to be set up for only group members to work and participate together on their presentations (Kendall, 2001).

When a surprise survey questionnaire was given to students to determine the overall satisfaction of WebCT, the results were very positive. 89.7% agreed that WebCT was straightforward to use and 85.7% found the features useful in their studies (Kendall, 2001). Students found the bulletin board feature to be very favorable in their communication, as well as the private e-mail feature. The chat feature, which provided online chat rooms between students and faculty, was not as popular as a communication tool, but still showed to be positive among students for discussion on research. Flexibility of studying was commented positively among students, but some had problems with managing their time.

The questionnaire also showed a few disadvantages among the students. Students complained that access was slow to WebCT. This mainly has to due with students accessing course materials from home instead of on the university's network. Another complaint from students was not being able to use the annotate feature which allowed students to make their own

notes to help customize the course materials. Finally, students commented that clearer instructions should have been given by the instructor at the beginning of the course to understand the features of WebCT (Kendall, 2001).

Overall, WebCT demonstrated to be an effective web-based teaching and learning tool for online teaching at Manchester Metropolitan University. The faculty was especially pleased to see the students' enthusiasm and ability to learn and do well in assignments through WebCT. The only problem with WebCT among the faculty was the lack of participation in the quiz facility. In one class, there was a quiz on a journal article posted on the facility for students to partake in at their desire. Only 36 of the total 46 students attempted the first quiz (78%) (Kendall, 2001). The second quiz posted on the facility dealt with visiting a number of websites. This time, only 12 (26%) students attempted the quiz (Kendall, 2001). The author, Margaret Kendall, believes that the length of time to access websites from home, and the pressure of time for students to take the quiz are influences in the lack of quiz participation. In addition, a lack of communication between the staff member and students can also be a factor. To improve the access of the quiz facility, Kendall suggests the completion of quizzes be a part of the formal assessment of the course unit.

WBT software, such as WebCT, has demonstrated to be an effective means of communication and problem solving between students and faculty. All of its features; bulletin board, private e-mail, chat, and student tracking; have shown to be very popular among students and faculty when teaching course material online. Since WebCT proved to be successful for the 1999-2000 academic year, Manchester Metropolitan University decided to implement WebCT for next year and in future programs. This way, other students can benefit from the use of WebCT to improve communication skills and enhance the learning process in education. Other WBT software is used to help colleges/universities develop online environments for its students and faculty. Blackboard Inc., a leading enterprise software company for e-education, recently developed a partnership with Distinction Systems, a leading UK software developer of education information systems, to help deliver an integrated solution that will provide a unified online campus environment for clients (Blackboard Inc., 2003). This will help to increase the use of web-based teaching and learning in colleges/universities, and lead to more opportunities to encourage online teaching in a classroom setting.

Conclusion

The use of web-based teaching and learning in e-commerce demonstrates effective technology in today's education. The foundation set by web-based tools past and present has developed into the successful implementation of web-based training (WBT) software in the classroom. The issue with designing web-based tools is imperative for an e-learning environment to take place in a college/university. Every detail has to be observed carefully by the faculty in order to be sure the WBT is effective enough to provide better staff development and self-motivation among the students.

Technology is changing the way businesses operate and function on a daily basis. There is a constant need from executives as well as college professors to have updated technology in their working environments in order to effectively educate their peers or associates on new concepts and ideas in a particular subject. The wave of computers, as well as the Internet, is enhancing the way a person can get an education from a college/university. If people are not taking the time to learn these new technologies, then they will miss opportunities to be successful in the future.

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