AN ANALYSIS OF THE LEARNING TECHNIQUES OF STUDENTS IN AN ON-LINE COURSE MANAGEMENT ENVIRONMENT

Linda Bean, Arkansas Tech University
Bill Harmon, Arkansas Tech University

Abstract

Utilizing technology as a vehicle to deliver instruction opens the door for students to meet with the instructor face to face or interact only with their computer. Why do students choose to take a web class as opposed to a lecture class? A study of a web class and lecture class was done to discover why students make decisions to be in the classroom or to be at home. Students were surveyed to reveal their preferences to taking a class. Does their learning style have anything to do with their decision making process? Analysis of these findings are discussed and analyzed.

An Analysis of the Learning Techniques of Students in an On-line Course Management Environment

Background

Three years ago, Arkansas Tech University brought the Pendergraft Library and Technology Center on-line as part of a $12.3 million grant from the Reynolds Foundation. This resulted in library use soaring to 500 percent with 388,000 visits in the first year. High bandwidth, adequate computers for general use on a first-come-first-serve basis, Multimedia Labs, Distance Learning facilities, and increased student and faculty use of computer resources boosted instruction quality considerably. Increased availability of new technology throughout the campus led the School of Business to upgrade its infrastructure and to provide laptop computers to its faculty. Classrooms were modified to allow faculty to connect their laptops to overhead projectors for use in lectures. That in turn led to the creation of a wireless network in the School so faculty could move their laptops from office to classroom and back without having to continually dock and undock from hardwire connections.

The explosion of enabling technology made it abundantly clear that the University needed to prototype course management software and evaluate its role in life-long continuing education. Many of the 5,577 students at Arkansas Tech University are self-supporting. Sixty percent of the University students are "non-traditional," maintaining jobs and families while commuting to campus for classes, which made web-based instruction appealing to a large portion of the University. These students are carrying a full academic load and working odd hours to maintain

their lives. The School wanted to make courses available to them at their convenience, and that means courses delivered asynchronously, via the Web. On-line instruction has great appeal because it does not affect scarce classroom space nor require additional student housing. The University can manage campus facilities more effectively and less expensively when supplemented with a virtual learning environment.

Based upon these needs, an easy-to-use course management solution became a requirement. A course management solution that would support the needs of students, staff, faculty, and publishers in a user friendly environment was sought.

The Prototype

The School found a prototype solution after utilizing and reviewing several course management products. Blackboard 5 course creation and management software was selected for prototyping. To experiment with Blackboard at Arkansas Tech, the University obtained a campus-wide license, so that any interested faculty member could participate. Arkansas Tech purchased the Blackboard solution pre-installed on two Dell 2400 servers running the Windows operating system, one to host the database and the other to host the course creation and management components.

The servers were placed with the University's Computer Services Team, to be managed by two of the database administrators (DBA), who took DBA-level Blackboard training to prepare for the task. Users gained access to the system over the University's Local Area Network, using a standard Web browser. By the start of the spring 2001 semester, the University was ready to begin to prototype an on-line course management solution.

Analysis of Student Learning Techniques

Immediately the School of Business was confronted with an on-line course management requirement when a senior-level Management Information Systems (MIS) course, for which the School had anticipated enrollment of 15 students, attracted 50 students. The problem: The computer lab in which the class was to be taught could only accommodate 30 students. The course offering was altered and made available on-line as a web based course, as well as an on-campus lecture based course in a computer lab. This allowed all 50 students to enroll.

All students were required to attend an on-campus lecture for their first meeting of the MIS course. The primary objective of the initial meeting was to properly orient the students on how to use the course management software and relieve some of their fears associated with the new system. Emphasis during this first meeting was on Log-on/Log-off, navigation, communications, calendar, course products, assignments, testing, and grade book features. At the conclusion of the class, students were required to complete a survey on Blackboard to: (1) demonstrate their proficiency on the system and to build confidence, as well as (2) collect statistical data on their backgrounds, perceived personality traits (Keirsey and Bates, 1984), and student status.

The survey revealed that of the 23 students participating in the web-based class, 18 students were determined to be extroverts. Some of the characteristics of extroverts include easy going, friendly, talkative, enthusiastic, responsible, a leader, outspoken, and alert. The students in the web-based course overall desired the convenience, flexibility, and the importance of being able to work full-time and complete a summer course at the same time. Non-traditional students as well as traditional students need to work in the summer and the flexibility of a web-based course allows for student success in completing a course during summer months or even during a full semester of study.

The characteristics of the 22% of the students in the web-based class that were introverts are more in line with reasons why introverts would choose a web-based course. Some characteristics for introverts to be considered are quiet, reserved, care about learning on their own, dependable, thorough and organized. These students prefer to be alone and are dependable enough to complete their work without the assistance of others including the instructor.

In the lecture class, extroverts and introverts were evenly divided at 50%. The reasons why the students chose lecture versus web-based ranged from needing face to face interaction and personal contact to being afraid of a web-based course and already being on campus for another course. The student's confidence level is not strong enough to attempt independent work. Another quality needed for students enrolled in a web-based class is self-discipline. Some students knew they needed the motivation of a personal instructor for them to be successful in the course and stated so in their reasons whey they chose the lecture class.

Based upon information compiled by Dr. Debra L. Nelson at Oklahoma State University, 50% of the introvert's career type most likely would be the role of an accountant. This rings true with the need to work alone, but able to be responsible and dependable. These are the same characteristics of 22% of the students in the web-based class. Therefore, their learning styles are similar, but 43% of the students preferred the lecture class to the web-based course.

Overwhelmingly, according to Nelson, the type of careers for extroverts fall into the categories of supervisor, marketing, sales agent, managers, bank officers, secretaries, and receptionists. All of these positions need employees with good people skills as well as strong communication and leadership capabilities. However, 78% of the extroverts were enrolled in the web-based course, which did not provide them with opportunities to work and interact with other students or the instructor. Their learning styles did not fit the nature of the web-based course. However, 56% of the students chose the web-based class to the lecture class.

As a result of the analysis of the students enrolled in a lecture or web-based class, the learning styles played a role in career choice, but did not play a strong role in which class to take. External reasons played a stronger role in the decision making of the students as to which class they preferred to enroll. However, it is a validation of the importance of having both types of courses available for students to choose. The mixture of traditional and nontraditional students is greater than even five years ago; therefore, students need the flexibility that a web-based class avails.

The University now has two semesters' worth of experience with Blackboard. More than 340 courses are hosted on the system, as are 3,000 users – 60 percent of the student body – including 112 of the University's 189 faculty members. The Blackboard servers see more than 5,100 hits per day, on average.

Course Management Lessons Learned

The Course Management System environment has been extremely successful at Arkansas Tech University during the prototype period. Acceptance by students has been more enthusiastic than acceptance by faculty. This can be attributed to the fact that Blackboard provides the student with an instant, robust organizational/communications tool with no effort on the student's part, while the initial set up of the course management environment for the faculty member represents considerable work up-front but with great long-term benefits.

The Course Management System has proven to be equally valuable for lecture as well as web based courses. When used in conjunction with a computer lab or wireless laptops it is absolutely a high value-added system for organizing the classroom.

Below is a list of observations of students and one faculty member taken from three lecture-based courses and one web-based course. There was no, repeat no, paper utilized in any of the courses.

Strengths:

- Instant grading system and feedback
- Testing via computer
- Paperless environment
- Announcement and Course Documents/Syllabus
- Off campus use
- Clock on exams
- Text Book links
- Ability to customize student welcome page
- Student discussion board
- Calendar feature
- Student's confidence in information security (grades) grew as the semester progressed
- Quick feedback from Instructor and Discussion Boards

Weaknesses:

- Grade percentage not accurate in student grade book
- No grade percentage in instructor grade book
- Test Integrity – Not absolute
- View exam multiple times (reduce to one)
- Numbering system on Exams is not 100% accurate. If a question was deleted it did not always renumber properly.

Recommendations:

- Questions should change color when answered
- Need a brief tutorial on-line for students - Manual on-line is not enough.
- Allow students to add their web links.
- Add a word processing capability with Spell-Checker
- Foreign language use (Need in two languages for foreign language study – recommendation came from a student majoring in Spanish). - Partially addressed in Blackboard 6.0 to be released in April 2002, but it will be limited to one language.

Perhaps the strongest feature of course management software is the way it enhances the instructional process by giving students instant feedback on exams. Students can take an entire exam, submit it, and receive their exam score immediately. They see the correct answers and references, and check them in their textbooks to see why they missed a particular question. Students indicate this feature alone has had a very positive impact on the learning process.
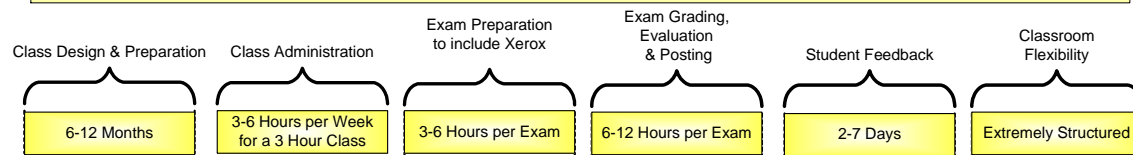
From the faculty perspective the course management system does not have enough features relating to test integrity at this time. Future releases promise question shuffling so that everyone in the class is taking a different sequence of the exam. There are also on-going discussions of having a "test bank" from which questions are randomly selected so that no one takes the same exam. In the former case, the exam is sequenced differently with the same questions; in the latter the questions are different but with the same degree of difficulty. There is research yet to be completed on how does one address the integrity issue of a self-administered exam that is taken from home or work as part of a virtual classroom environment. Perhaps the "test bank" with random selection of exam questions will offer a solution.

Students also say they like the way the course management system consolidates scheduling information for all of their courses on the system, together with their individual grade book, class links and calendar information, onto a single site, making it easier for them to manage their schedules.
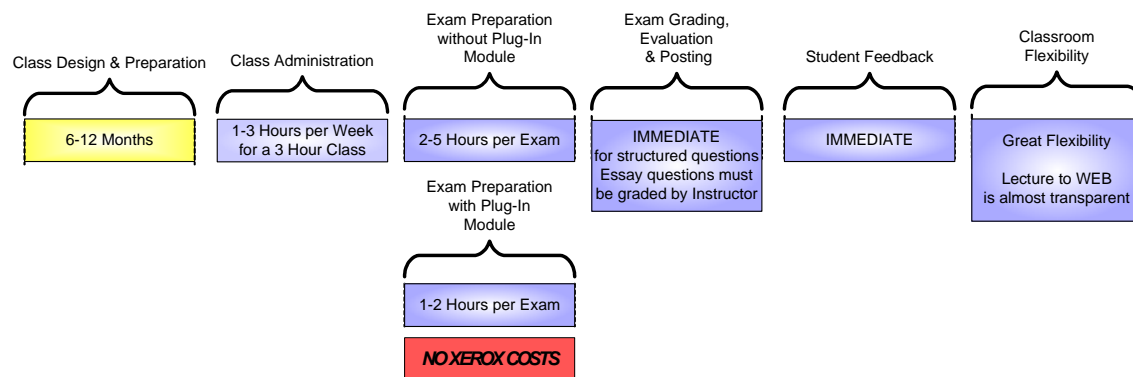
Another favorable development has been the University's adoption of plug-in module capability, which allows faculty members to use the growing banks of plug-in teaching modules made available with the textbook as part of the textbook delivery. The capability extends the resources available to faculty members and students since it reduces the need to re-key text and other supporting material needed in the course. Faculty members are also beginning to experiment with the chat and whiteboard capabilities to offer virtual office hours.

In some cases the course management system has saved time and in others it has redistributed the time to other tasks. However, overall the time savings are significant as shown in the following page.

BEFORE COURSE MANAGEMENT ONLINE

Class Design & Preparation	Class Administration	Exam Preparation to include Xerox	Exam Grading, Evaluation & Posting	Student Feedback	Classroom Flexibility
6-12 Months	3-6 Hours per Week for a 3 Hour Class	3-6 Hours per Exam	6-12 Hours per Exam	2-7 Days	Extremely Structured

AFTER COURSE MANAGEMENT ONLINE

Class Design & Preparation	Class Administration	Exam Preparation without Plug-In Module	Exam Grading, Evaluation & Posting	Student Feedback	Classroom Flexibility
6-12 Months	1-3 Hours per Week for a 3 Hour Class	2-5 Hours per Exam	IMMEDIATE for structured questions Essay questions must be graded by Instructor	IMMEDIATE	Great Flexibility Lecture to WEB is almost transparent

Exam Preparation with Plug-In Module

1-2 Hours per Exam

NO XEROX COSTS

References

Keirsey, D. and Bates, M. (1984). *Please Understand Me Character and Temperament Types*. DelMar, CA: Prometheus Nemesis Book Company.

Nelson, D. L. 1993. *Careers Most Typical for MBTI Types.* (Conference Paper, Oklahoma State University)