Learning from Students: A Study Into The Use of *Class Web Sites* in a Liberal Arts College Environment

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Abstract

In today's liberal arts college environment, one can observe a proliferation of web sites associated with faculty members of the various academic departments and their current course offerings. These *Class Web Sites*, as they are known, are not necessarily tied to what is referred to as a distance education or a computer-mediated class. As a vehicle for delivery of course content, several questions can be raised: Are *Class Web Sites* useful to the students? How often do the students access their *Class Web Site*? Do the *Class Web Sites* serve merely as an alternative information delivery mechanism or can they be used to enhance and enrich student oriented learning processes? It is to the later question that I conducted an inquiry research project. During the spring, 2000 semester, I created and managed four different *Class Web Sites*. This paper provides a description of the four *Class Web Sites*, their purpose and slight variations in uses, some empirical data on the development and maintenance aspects from a faculty perspective and the findings of the student responses. Several conclusions are presented concerning the effectiveness of *Class Web Sites* for extending student learning beyond the classroom.

Keywords: Class web sites, student learning, classroom technology, course management systems

1. INTRODUCTION

Edgewood College is a private, liberal arts college located in Madison, Wisconsin. The Computer Information Systems (CIS) degree program ranks fifth in declared majors (in spring, 2000, there were 65). The CIS degree includes several courses in information systems, computing, business, general education and liberal arts. The student population at Edgewood is comprised of both full and part-time traditional age and returning adults

In the spring, 2000, I created and managed four distinct *Class Web Sites*. By offering a web-based location for extending traditional classroom activities, I wanted to provide an additional resource to students, outside of the classroom and the opportunity for the students to apply newly acquired content into relevant contexts. Class duration was three hours per week, concentrated in one session. The *Class Web Sites* served as central repositories for standard course material, such as syllabus, assignments and schedule. It was not intended that a *Class Web Site* would **replace** the activities that occurred in the traditional college classroom; rather, it was anticipated that the *Class Web Site* would complement the classroom activities.

Assumptions

I taught the courses during the previous academic year without the existence of *Class Web Sites*. At that time, the typical classroom activities and resources included the use of PowerPoint presentations, authored handouts and guided learning activities and articles from periodicals and industry publications. On average, it took approximately three to four hours per class to create instructor-oriented notes and student guided learning activities and to photocopy the handouts for students. It was assumed that all of the above-listed activities and resources could be included in conjunction with the *Class Web Site*.

From a pedagogical viewpoint, I anticipated that a *Class Web Site* would provide an additional base of information for student use (review *and* reflect). The purpose of the *Class Web Sites* was to assist the students in moving beyond simple information recall and comprehension and apply the facts into both known and unknown contexts. Given the time constraint, I recognized that the development of the *Class Web Sites* would be an iterative process and intended to incorporate regular student feedback throughout the semester. I was the only instructor teaching these courses and had complete control over content and delivery. Each *Class Web Site* contained

weekly postings of class notes. Instead of a written lecture, the class notes provided only a framework or outline of the topics for class. Each framework was designed as a guided learning activity for the students for use during class. The lesson notes for each class were uploaded no earlier than three days prior to class; it was important to retain flexibility in order to adjust the pace and content, thereby reflecting the real-time learning attributes of the individual students and the class as a whole.

Definitions

Currently, there exist three different technologies available for extending classroom learning: *Class Web Sites*, Course Management Systems *and* Learning Management Systems.

Class Web Sites refer to the use of a web site for purposes of housing information (content) related to a particular class (for example, section 001 of class CS420 for the Spring, 2000). It includes information relevant only for that particular class. The *Class Web Sites* in the study housed the following information: course syllabus, topic map, description of all assignments, class notes (in outline format), presentations produced for viewing on the Web, links to resources, either located locally on the web server or on the Internet, a threaded discussion web page and various "special notices," such as directions to location of the class visit, or download instructions for software used during an on-line class.

Class Web Sites utilized the technological configuration of HTTP *and* a client web browser. The original assumption was that ***any*** client web browser would suffice; in practice, only the use of Microsoft's Internet Explorer (v 5.0 or higher) would work with *Class Web Sites* used in this study.

Questions To Ponder

Instructional Delivery *and* Management: How much time would be required to create, maintain and evaluate the *Class Web Sites*? What would be the technical difficulties? What types of expertise would be required by the instructor and the students?

Pedagogical *and* Student Perspectives on Learning: How often do the students access their Class Web? Do the *Class Web Sites* serve as merely an alternative information delivery mechanism or can they be used to enhance and enrich student oriented learning processes? Are *Class Web Sites* useful to the students?

***Class Web Site* Activity**

Much of the time spent on weekly activities was in the preparation of lesson notes and their associated resources. Activities included the creation of material, importing of files and directories to the web site, testing of technical publication, links, security validation and client connection performance tuning. Due to the technical characteristics of Office 2000, it took a significant amount of time to create the appropriate file format and manage the placement of files, to minimize broken web links. Testing was required from both on and off campus to ensure that all files and links functioned correctly. The instructor continually monitored the resource links located on the Internet, as these links frequently disappeared from the Internet locating system.

At the end of the semester, a review of the time logs revealed that overall, the creation *and* management of the four *Class Web Sites* required approximately one-third more time over and above normal the weekly preparation for class.

2. STUDY CHARACTERISTICS

I conducted three assessments with each class to obtain student perspectives on the usefulness of their *Class Web Site* and its effectiveness as a learning resource.

Using a combination of Likert scale and open-ended questions, the assessment reviewed the four main components of the *Class Web Sites* (Class Notes, Assignments, Resources *and* Question of the Week). The first survey, completed at seven weeks, focused on reasons for access *and* frequency; the second survey, completed at fourteen weeks, focused on usefulness of class web site components. This survey also included open-ended questions, to allow students to add additional explanatory comments. At the end of the semester, I facilitated, with each class, a large group discussion, posed a series of open-ended questions, written specifically for that class, obtained student feedback on author assumptions and solicited suggestions for changes and improvements.

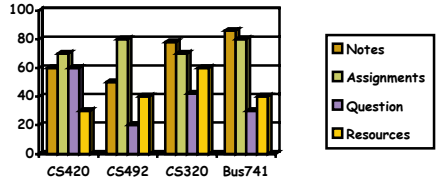
3. RESULTS FROM SURVEYS AND DISCUSSIONS

Survey #1

In total, there were 45 student (27 undergraduate and 18 graduate) responses. The vast majority of the students (73%) were within 3 semesters of graduation. 49% were under the age of 30 years, with another 31% under the age of 40. 83% of the respondents accessed the class web site between 1-3 times per week outside of class. Another 15% accessed it between 4-6 times. In terms of accessing the *Class Web Site* before class, students were evenly spread across the different timeframes of access (1 hour, morning or afternoon, 1 day and more than 1 day). After class, the students accessed the class most frequently within 3-5 days (74%). Students indicated that the most important reason for access was to either to review the previous week's class notes or review any assignments due

(45% and 47% respectively). Use of class resources and review of upcoming class notes received rating more evenly distributed between high and mid-range, dropping off at the low end. Students regarded the question of the week as a less significant reason to access the class web site.

Table 1: Reasons for Student Access in terms of percentage of students (Survey #1)



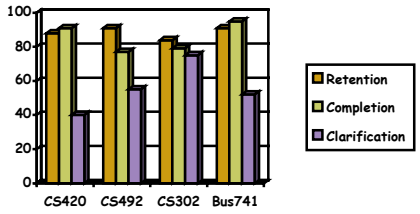
The students rated the class web site functionality consistently high in terms of ease of navigation and usefulness of lesson notes *and* assignments. Less highly rated were aesthetics, announcement page, lesson note resources and course resource links. Ratings dropped significantly for the question of the week.

Survey #2

In total, there were 47 student (28 undergraduate and 19 graduate) responses. Percentages for time of access were different between class notes and assignment components and resources component. Class notes and Assignments were accessed 30% and 35% prior to and 27% and 24% during class, while Resources were accessed 9% prior and 28% during class. Class notes were never accessed 1%, Assignments 3% and Resources 15%. In terms of usefulness, respondents indicated that Class notes were used evenly for note taking during classes, for reference after class and for studying. Assignments were used primarily for workload and for reference during and after class. References were used to assist assignments completion after class, referencing and studying. Each component received a high rating for organization and similarity to actual activity in the classroom. Resources were seen as relevant and useful.

Overall, the students ranked class notes and assignments components consistently high in terms of improved understanding, learning retention and relevance of component for referencing at a later date (high of 91%, low of 61%). Further, students indicated a high satisfaction level for assistance in clarification of subject area (took better notes, assisted in clarification, contributed to successful completion) (high of 83%, low of 61%). Resource Links scored lower in terms of retention and clarification (high of 68%, low of 40%).

Table 2: Student Responses to Benefits in terms of percentage of students (Survey #2)



Survey #2 included optional, quantitative questions. The highest portion of responses pertained to the class notes (36), but there were a significant number of responses in both assignments (28) and resource links (20) sections. Students affirmed the usefulness of the three components and provided suggestions, such as "keep resources short", "make all the notes available at the beginning of the semester", rather than on a weekly basis and centralize, wherever possible, the links for the various aspects of the course (class notes, assignments and resources).

Large Group Discussions

At the end of the semester, each class was asked a separate set of questions. The first set of questions addressed the relationship between the availability of computers in the classroom and the use of the *Class Web Site*. CS420 met in the classroom without computers, so student access to the web site occurred exclusively outside of actual class time. Students suggested, given the relevance and usefulness of the software downloads and demo software, that future classes be conducted in a classroom with computers. Interestingly, students in CS302, which met in a computer classroom, observed that the computers were distracting and a temptation existed to browse the Internet during class, rather than stick to the class web site. Bus741 met in a non-computer conference room and students suggested that having computers might have proven to be a hindrance and a distraction.

The second set of questions explored the link between the functions of *Class Web Site* and student utilization for learning. Student responses reinforce the earlier survey results that class notes were perceived to be valuable for review and were used regularly.

Different individuals from all the classes commented that, because of the links, they found more resources than they would have on their own. The students began their searches using the resources on the *Class Web Site*; their perception was that their research took on a wider scope because of the resources on the web.

The vast majority of CS492 class time was used for a project, not content. In survey #1, the class indicated

that the *Class Web Site* was useful. Further, the resource links contained real-world examples of similar projects and students were able to relate those experiences with their own. The mere presence of the *Class Web Site* reinforced the relevance and usefulness of their project. In summary, discussions with the students confirmed the following assumptions:

- Pedagogical approach was valid: the *Class Web Sites* did extend the classroom learning beyond the actual time in class
- The availability of resources, located on the *Class Web Site* provided a wider scope and base for discovery
- Students found that modeling the technology was beneficial

4. INTERPRETATION OF RESULTS

The students confirmed that the *Class Web Sites* served a useful, functional purpose. Halfway through the semester, several students, using one particular ISP (Internet Service Provider) experienced significant downtime and lost access to the *Class Web Site*. During the class immediately following the downtime, these students compared the loss of access to "losing their right arm". They wondered, "How did they ever managed before?" (the *Class Web Site*).

Students overwhelmingly believed that the *Class Web Site* content (class notes) assisted in content understanding and contributed to an increase in their subject matter retention (91% for both areas). 90% of the students held the perception that having the assignments on the *Class Web Site* increased their understanding and aided in the successful completion of their assignments. 63% of the respondents in Survey #2 stated that they took better notes in class; further, responses to the qualitative questions in Survey #2 and to the questions posed in the group discussions during the last class suggests that the class notes assisted students in clarifying concepts discussed in class. However, students stated that the resource links and the "question of the week" discussion page was not as useful (36%) for retention and clarification, but gave higher scores for the resource links that were targeted for a specific class or assignment (63% and 83% respectively).

Did the *Class Web Site* extend student learning beyond the classroom?
If student use of the *Class Web Site* acted as an extension to the learning that occurred in the classroom, were student learning processes different, outside of the classroom? What aspects of the *Class Web Site* provided the links between the two learning environments?

The use of *Class Web Sites* changed the distribution method for each class, by providing an electronic forum and format. I originally assumed that the *Class Web Site*'s pedagogical purpose would be complementary to traditional classroom activity. In practice, some of the classroom activities were actually replaced by the *Class Web Sites*: photocopying and distribution to the students of the course syllabi, topic map, assignments, grading criteria and resource materials located in supplementary textbooks, periodicals, Internet source sites and presentations.

In previous years, students attending these classes engaged in learning outside the classroom, for both individual and group-oriented activities. However, responses from this study indicate that students frequented the *Class Web Sites* on a regular basis, not just for preparing for class. In utilizing the *Class Web Site* as a vehicle for facilitation of activities and reference, it seems that students were engaged in a more frequent, broader and, in some cases, deeper level of learning. While the *Class Web Sites* did not replace specific pedagogical activities in the classroom, such as interactive discussions, the repository aspect did extend student learning beyond the classroom, in a different manner than before.

What was the impact of the availability of additional learning resources beyond what would have been provided in a more traditional classroom?
The *Class Web Site* served as a vehicle for distribution of all types of resource material. Resources located on the Internet and videos located on the *Class Web Sites* were utilized by the students, but only if they could access them in a timely fashion. For example, not all students could access the *Class Web Site* from their home location; some Internet connections were too slow and would not load the PowerPoint presentations correctly. Some students could view resources but could not print them. It appears that in some circumstances, the *Class Web Site* had only a marginal impact on resources availability beyond what was available in the traditional classroom.

The CS302 class met in a classroom equipped with computers, one per student and the students were able to utilize the *Class Web Site* for viewing material during the "lecture" component of class time. Students in CS302 used their *Class Web Site* during small and large group activities. I designed several activities specifically requiring the students to access on-line resources (whether from the Internet, or material prepared in electronic format) for both in and outside the classroom. Students were able to cover more material and their in-class presentations produced reports that were broader and deeper. Student observations from this class, in particular, suggested that their *Class Web Site* provided a broader base of

information and a wider foundation for their learning processes.

Did the availability and use of the *Class Web Site enrich* student learning?
For purposes of this study, to "enrich student learning" is defined by four characteristics: enhancing value, improving quality, augmenting and supplementing through extension and deepening a student's learning experience.

Students referred back to the *Class Web Site* on a regular and, increasingly persistent basis. Students reported that they accessed the *Class Web Site* ***not just during class, but at home and at work.*** It appears that while the availability of the *Class Web Sites* alone did not cause learning to happen outside the classroom (it was already happening), it did expand and change the nature of the learning. Student perceived the repository function as extremely beneficial and believed that it contributed to a higher level of retention and success. In fact, students began using the *Class Web Sites* during the interim time between classes to review concepts, apply new material to new contexts (at work or in other academic courses, such as Business) and to work on assignments. During the end of semester discussions, several students reported that they experienced a higher level of satisfaction when completing their assignments. The *Class Web Sites* were convenient, in that students could work on assignments on a more frequent basis, when they were "in the mood to, rather than wait until they were back home, or in class".

Did the **loss** of the *Class Web Site* impact the students? Students indicated that it did. Those attending Bus741 were directly impacted by their inability to access the *Class Web Site* at home and at work. They believed this restriction diminished the value of the *Class Web Site* for them, and in some cases, had a negative impact on their preparation and effectiveness as learners. Several students depended on the *Class Web Site* for a wide variety of purposes, including exam preparation and research activities.

5. CONCLUSIONS

From the results of the study, I learned from the students that having and using their *Class Web Site* provided several key benefits: it served as a framework for class, increased their preparation to learn, facilitated continued learning after class, provided an expanded base for a broader view on the subject area, reinforced learning and increased retention. The *Class Webs Sites* were not just useful. **According to the students, the *Class Webs Sites* served more than just as an alternative information delivery mechanism. They were used to enhance and enrich their learning processes.**