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An analysis of factors that lead WebCT users to either increase or decrease the use of WebCT GOLD at Iowa State University

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An analysis of factors that lead WebCT users to either increase or decrease
the use of WebCT GOLD at Iowa State University

by

Darshana P. Juvale

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Education (Curriculum and Instruction)

Program of Study Committee:
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Iowa State University
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2008

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ABSTRACT

This study examined the views and experiences of the instructors and administrators who used WebCT GOLD in the fall 2007 semester. An online survey using multiple-choice and open-ended questions was distributed to a convenience sample of the specified WebCT users at Iowa State University. Descriptive data were collected on demographics, reasons instructors changed their WebCT GOLD usage in the fall 2007 semester as compared to the previous semester, and reasons instructors used certain WebCT GOLD tools the most, while ignoring the rest. The response rate for the survey was almost 18%. The data indicated that a comparatively larger number of respondents increased their use of WebCT GOLD as compared to those who decreased or did not change the WebCT GOLD usage for the fall 2007 semester. Nevertheless, the comments received from the respondents strongly indicate major shortfalls in WebCT GOLD that need to be addressed in order to achieve effective education using WebCT. The statistical data analysis suggest that despite the availability of 20 tools in WebCT GOLD, only the tools such as grade book, announcements, assessments, discussion, and file manager that help reduce work load and increase efficiency were used the most, while instructors ignore the other tools. The findings of this study may help administrators and WebCT GOLD programmers support instructors’ effective use of WebCT GOLD, and researchers may learn issues with using WebCT GOLD that need further study.
CHAPTER 1. INTRODUCTION

Background of the Study

Today’s freshman student comes to class with a laptop in his backpack, an iPod in his ears, and a touch-screen, voice-activated phone in his pocket. This is the generation that was nurtured on video games and digital storytelling. According to Weir et al. (2006), “Today’s incoming freshmen, born in 1988, have never known a time when the Internet and personal computers were not ubiquitous. They expect ‘what I want, when I need it, wherever I happen to be, on whatever workstation I have available’” (p. 52). Similarly, the research headed by Kvavik (2006) concluded that the convenience factor is the prominent reason students give for favoring Learning Management Systems in educational institutions. Not surprisingly, the current generation of tech-savvy students favor and demand the ever-increasing use of technology in the field of education, and, at the same time, ever-increasing number of students in the educational institutions are increasing the workload for instructors. According to Toppo and DeBarros (http://www.usatoday.com/news/education/2005-02-02-college-cover_x.htm), from 1990 to 2002 the percentage of 10th-graders aspiring to college rose by 21%, from 59% to 80%. Considering this scenario, a clear need exists for the development of various software programs that could assist educators in handling ever-increasing number of students as well as satisfy students’ demand for the latest technology.

One more essential factor that supports the development of Web-based software is the increasing number of students opting for distance education. According to recent statistics from the U.S. Department of Education, in 2000-2001
college-level, credit-granting distance education courses at either the undergraduate or graduate/first-professional level were offered by 55% of all two-year and four-year institutions. (U.S. Department of Education. 2003, p. iii). Online courses are gaining fast popularity, especially with the advancement in high-speed Internet service. Online courses are especially convenient for individuals who cannot attend traditional classes due to family or job commitments. Thus, a need also exists for a Web-based software programs that can help instructors to handle the large number of students in the classroom as well as to help deliver online courses for students at a distance.

Several Learning Management Systems (LMSs) are currently used by educators to meet some of these demands. LMSs are available either as commercial products, such as WebCT, Blackboard, Intralearn, FirstClass, etc., or as open-source products such as FLE (http://fle3.uiah.fi/). The LMS that is currently used at Iowa State University is WebCT. With the large number of courses using WebCT at Iowa State University, it is essential to conduct a comprehensive study to provide information on faculty members’ views and experiences regarding use of WebCT in their teaching. This quantitative study analyzed the factors that are responsible for faculty members’ decisions to either increase or decrease the use of WebCT GOLD in their teaching.

This next section provides the definitions of a Learning Management System (LMS). It is followed by the purpose of the study, a problem statement, a brief overview of the procedures used in the study, and the limitations of the study.
Learning Management System

“Learning Management System,” which is also known as “Course Management System,” is a term coined for the use of computers and computer-aided software in the field of education. LMSs have been in various stages of development since the 1990s, and various educators and researchers have studied the evolution of LMSs and their impact on student learning, which has led to various definitions for the term LMS.

According to Paulsen (2003), “Learning Management System is a broad term that is used for a wide range of systems that organize and provide access to online learning services for students, teachers, and administrators” (p. 5). According to Vollmer, “learning management systems were originally developed in the early to mid-1990s to handle the administrative functions of online training, and they included management of all aspects of training outside of the virtual classroom” (Vollmer, 2003, LMS and LCMS History section, par. 1). Moreover, Hall (2003) suggested a LMS is “a software that automates the administration of training events. All Learning Management Systems manage to log-in of registered users, manage course catalogs, record data from learners, and provide reports to management” (p. 1).

Although LMSs were originally designed to target distance education, they have now evolved into Web-based systems that manage both online and offline courses (Vollmer, July 2003). According to Pollack (2003), a “Course Management System can be used as a vehicle to deliver a course online or as a supplement to the learning process for a traditional face-to-face course” (p. 225).
Following a review of the aforementioned definitions of a Learning Management System, I chose to describe LMSs as Web-based applications that are used by faculty members to manage both online and face-to-face learning and to enable students learn in easier and efficient ways. LMSs are also used by institutions to manage administrative data and procedures.

Learning Management Systems at Iowa State University

WebCT was introduced at Iowa State University in 2001, when 30 courses made use of it. In the past six years, the use of WebCT has expanded at a rapid pace. According to the recent available data, in 2004 1,687 courses at ISU made use of WebCT (Center for Excellence for Learning and Teaching Office, ISU). WebCT claims to be user friendly and highly flexible, offering various tools such as online quizzes, discussion boards, calendar posting, e-mail, chat rooms, etc. These tools are intended to create an interactive learning environment fostering communication between teachers and students. For the students, WebCT makes the course material more streamlined and available through the Web servers. It can also save time for the students, and it offers them a platform wherein they can communicate effectively with each other as well as the faculty. On the other hand, for faculty members, WebCT tools help them to manage their course more easily and improve the quality of education for the students. WebCT can also (a) reduce faculty workload through tools such as automatic grading, (b) increase communication via e-mails and chat boards, and (c) promote collaborative learning via discussion boards and chat sessions.
The next section focuses on the problem statement for this research.

**Problem Statement**

Various promising factors entice faculty members into incorporating a LMS in their teaching, such as saving time by using technology and improving teaching practices. Some of the driving factors for the use of LMSs by faculty are (a) posting PowerPoint® slides that can be printed and brought to the class to offer a good collection of both images and text for the students; (b) providing supplementary material and additional learning activities to increase active learning outside of class; (c) enabling student feedback by e-mail, chat, or discussion-board posting; (d) administering online quizzes for practice with immediate feedback to the students; (e) increasing communication with students with the announcements tool, which enables faculty members to post friendly reminders about assignments or syllabus updates, etc. (Frey, 2004). Moreover, Frey stated the following about LMSs:

LMSs are a relatively easy and inexpensive way to provide course materials and to communicate with students. They are timely, secure and flexible. They allow faculty to extend class time, offer just in time resources, provide practice with immediate feedback and promote collaboration. (p.7)

Norms and reward structures can influence faculty members’ incorporation of technology. In their study on faculty adoption of course management software at Colorado State University, Yohon, Zimmerman, and Keeler (2003) noted that “faculty
evaluations for annual merit raises, tenure and promotion may reflect the importance of using technology and course management software” (p. 316).

Another major factor that might encourage faculty members to incorporate LMSs in their teaching is the availability of technology training and support from their institution. In a study by Yohon et al. (2003), WebCT adopters reported significantly higher frequencies of attending seminars on information technology, discussing information technology with other faculty members, and trying new software programs as compared to WebCT non adopters.

Despite obvious advantages of LMSs (like WebCT) that offer various tools to help faculty members, research suggests that very few of these tools are frequently used by faculty members. Yohon et al. (2003) found that most faculty members utilized only certain tools of WebCT, such as syllabus, grade book, e-mail, and PowerPoint presentations, but they disregarded other interactive tools of WebCT:

A closer look at what WebCT tools are used reveals that WebCT’s Web site publishing tools such as content page, syllabus, and presentations distribution tools are the most used, while the interactive tools such as chat, group presentations, and threaded discussions were seldom used (p. 317). The authors also suggested that the penetration of LMSs is still not deep enough in the faculty community. Even though the university had made efforts to encourage faculty members to adopt LMSs in their teaching, less than two-fifths of the faculty members in arts and sciences departments used WebCT.

Daugherty and Funke (1998) researched faculty members’ perceptions of Web-based instruction at Georgia College and State University-Milledgeville. Their
findings revealed various challenges faced by faculty members: lack of technical support, lack of software and adequate equipment, lack of faculty/administrative support, the amount of preparation time required to create assignments, and student resistance.

Because of the ever-increasing demand for implementing LMSs in education by the universities and the large percentage of faculty members still reluctant to use LMSs to their full potential, it is important to know the factors that both (a) drive faculty to either increase or decrease the use of the LMSs in the future and (b) drive faculty members to use certain tools of LMSs, ignoring the others. A search through the relevant literature provided numerous publications describing the issues faced by faculty members using LMSs at different institutes. But there is no clear picture about the views and experiences of the instructors about their WebCT GOLD usage at Iowa State University, which lead to the purpose of this study.

**Purpose and Research Questions**

The purpose of this study was to examine the experience and gather the views of WebCT users regarding use of specific tools of the LMS (in this case, WebCT GOLD) and determine the factors that persuade or dissuade WebCT users to stick with the use of WebCT GOLD. This research study specifically examined the use of WebCT GOLD by WebCT users at Iowa State University. The study was guided by the following research questions:

1. What are the demographic characteristics of WebCT GOLD users at Iowa State University?
2. What factors determine whether the users increased or decreased their use of WebCT GOLD in their teaching?

3. Which WebCT GOLD tool/s do users value the most and which tool/s do they find less useful?

4. Is there any relationship between the WebCT GOLD tools used by the users and the users’ demographical characteristics?

**Procedures**

The study used a survey methodology to collect quantitative data from the population. The population was a database of WebCT users that had used WebCT at Iowa State University. Participants were not randomly selected, and all received the same survey. The survey contained 19 quantitative questions and 2 open-ended questions.

**Limitations**

This study is limited to a data base of WebCT users who had used WebCT at Iowa State University, and the use of this sample limits the ability to generalize the findings outside of Iowa State University. The WebCT users at other institutions may have different views and experiences and, therefore, will not be represented by this sample population.

In this study, one of the major limitations is the assumption that an approximately equal percentage of all the respondents from each fraction (either saying yes or no for a particular question) have responded to the survey. For
example, consider the question that asks the respondents whether they had increased, decreased, or not changed their WebCT GOLD usage in the semester of fall 2007 as compared to the previous semester. The study assumes that the same proportion of respondents from each category of the possible answers (increased, decreased, or no change) have responded to the survey. But, there is always a chance that the larger proportion of the WebCT GOLD users who had decreased their use of WebCT GOLD responded to the survey, falsely increasing the final percentage.

It needs to be noted that for the fall semester of 2007, Iowa State University introduced WebCT GOLD over the older version, WebCT Cardinal. It is possible that this enforcement might have made some of the respondents biased against the WebCT GOLD, not necessarily because the Cardinal version was better, but because of the comfort level of using the cardinal version.

One must also note only 20% of the total WebCT GOLD users responded to the survey. Furthermore, the survey does not include students’ perspectives about WebCT GOLD, so this study gives only one side of the story. The survey also needs more than one run and a redesign to demonstrate the reliability required to avoid error.

**Summary**

This chapter included definitions of Learning Management Systems, a brief overview of the Learning Management System used at Iowa State University, the introduction of the problem, the purpose and limitations of this study, and the
procedures used in the study. The research questions were also established in this chapter. Chapter 2 contains an in-depth review of the literature. Chapter 3 explains the methodology for this study, and it also discusses the design and delivery of the survey instrument, along with collection and organization of the data. Chapter 4 provides a summary of the results and a discussion of the study is presented in chapter 5.
CHAPTER 2. REVIEW OF THE LITERATURE

The literature review chapter begins with a brief introduction, followed with a discussion of the methods used for searching through the literature. Next is a section on background and history of Learning Management Systems and then a brief summary of articles that focus on the research related to diffusion of LMSs in higher education.

Introduction

Learning Management Systems have revolutionized higher education in the past decade. Since more and more educational institutes are facing financial challenges and an increased number of students per instructor, a lot of research efforts are being devoted to solving these problems without letting the standard of education slip (Yeung, 2002). “Learning Management Systems” (LMS), an alternative term for a “Course Management Systems” (CMS) that commonly uses Web-based software and can be accessed and controlled via computer, have been a great boon to educational institutions. While helping universities to manage large classes, reduce workload for instructors, and simplify administrative duties, LMSs have been helping educational organizations maintain competitiveness and offer quality education to their students. According to Yeung (2002), many educational institutions invest heavily in the usage of Web-based learning in hopes of keeping their “high-tech” image in the eye of the public.

Since LMSs are a recent tool, all aspects of their impact on instructors, students, and educational philosophy are yet fully understood. According to the recent studies and surveys, there are some potential reservations in the instructional
community about using all the tools of LMSs. Research also suggests that many instructors use only certain tools that help reduce their workload but do not improve students’ collaborative learning (Yohon et al., 2004).

In this chapter, I present a literature review of research that will address two major questions: the factors that drive instructors to increase or decrease their use of LMSs in their teaching and the factors which drive instructors to use certain LMS features or tools while avoiding others.

The Search

A number of search engines were used to gather the literature for this study, starting with Google Scholar. For the initial search, the key phrases used were “Learning Management System” and “Course Management System.” Alternative search phrases used were “instructional technology,” “Web-based education” and “e-learning,” which provided several relevant articles. Using these key words helped in finding articles related to the methods and the tools used for effective e-learning. These key words also provided articles which were not only related to use of LMSs, but also to use of Web-based education in general. Articles related to use of the Web in the field of education were identified, and then I narrowed down the articles and selected only those articles which were related to faculty use of LMSs in distance education and face-to-face education. In addition to these articles, articles specifically related to Web-based education were also preferred. All the articles which used the above articles as their references were also searched.
In addition to the Educational Resource Information Clearinghouse, a librarian also helped with a search of articles through the Educational Abstract, Professional Development Collection, and PsycoInfo databases. The descriptors used for the search were “computer assisted instruction” and “faculty use,” and different key search phrases were used in order to get as many articles as possible. Using only “Learning Management System” and “Course Management System” did not lead to many relevant articles.

Journals such as Computer Assisted Learning, Journal of Educational Media and Library Sciences, Journal of Technology in Human Services, Journal of Distance Education, and Journal of Computer Mediated Communication were included in the search. In addition, articles related to teaching with technology, learning styles and learning performance in a LMS-based settings, evaluating technology and instruction, faculty and students perspectives on Web-based learning, and experiences with Learning Management Systems were studied.

All the articles were sorted according to topic. All the articles related to e-learning, distance education, and any kind of Web-based education were separated from the articles which were specifically related to LMSs such as WebCT. The articles which focused on LMSs and their uses and issues along with articles related to distance learning, e-learning, Web-based instruction, or technology in general in the field of education were selected. Finally, the literature review consisted of about 20 articles.
Background and History of LMSs

In the first half of the 20th century, various technologies such as audio devices and video clips started making appearances in the field of education. But in the 1990s a furious growth of technology use in the field of education took place. Digital media as well as computer-aided software started making inroads in the classroom. In the last five years, the use of computers and computer-aided software has become so common in the educational field that educationists actually coined a term “Learning Management System” (a generic term for “Course Management System”) for this software. Actually, LMSs have been in various stages of development since the late 1990s, and since various educationists and researchers have been studying the evolution of LMSs and their impact on student learning, various definitions of LMSs have been proposed.

According to Vollmer, “learning management systems were originally developed in the early to mid-1990s to handle the administrative functions of online training, and they included management of all aspects of training outside of the virtual classroom” (Vollmer, 2003, LMS and LCMS History section, par. 1). While Paulsen (2002) offered the following definition: “Learning Management System is a broad term that is used for a wide range of systems that organize and provide access to online learning services for students, teachers and administrators” (p. 5). Moreover, Hall (2003) defined LMS as a software that automates the administration of training events. LMSs also manage the login of registered users, manage course catalogs, record data from learners, and provide reports to management.
The evolution of LMSs was very much encouraged by the expansion of the World Wide Web as well as increasing speeds that data can be transferred over the Internet. With fast Web access now available in nearly every corner of the world, Web-based LMS applications are being engineered today in increasing numbers by numerous institutions and companies that want to get involved in e-learning either for providing services to third parties or for educating and training their own people (Avgeriou, Papasalouros, Retalis, & Skordalakis, 2003). Also, Avgerious et al. mentioned that “the Learning Management Systems (LMS) are specialized Learning Technology Systems (IEEE LTSC, 2001a), based on the state-of-the-art Internet and WWW technologies in order to provide education and training following the open and distance learning paradigm” (p.1).

One of the important factors that has played a role in fueling the growth of Web-based education is economics: universities and educational institutions are facing constant challenges to balancing their budget. On one hand, the expense of running educational systems is growing due to the increased competition to attract and retain students, while, on the other hand, institutions are facing constant cuts in financial support. This situation has led to skewed student-to-teacher ratios, and today’s instructors are required to juggle ever increasing numbers of students in their classes, which has led to an increased workload. Web-based education has provided some relief to these over-worked instructors since the Web-based programs are designed to manage large number of students though automated processes. According to Morgan (2003), “faculty members adopt Course Management Systems principally to manage more mundane tasks associated with
teaching, especially teaching large classes” (p. 2). She also mentions that faculty look to LMSs to help them communicate easily with students, to give access to class documents, and for the convenience and transparency of the online grade book.

The combination of the above mentioned factors coupled with an exponential growth of Internet users has caused the popularity and the use of the LMSs to grow at a breakneck pace over the past few years. A 2002 Gartner Research Survey reported that 95% of colleges and universities are now employing e-learning systems as a part of their educational delivery (Pollack, 2003). Much of the success of e-learning can be attributed to the availability of LMSs, also known as a Virtual Learning Environment (VLE) or learning platforms (Paulsen, 2003).

Though LMSs were originally designed for distance education, now they have evolved into Web-based systems, managing both online and offline courses (Vollmer, July 2003). The reason behind this shift in use is well explained by Frey (2004):

Course Management Systems (CMS) have become important software for traditional resident faculty as well as distance education faculty as these software help them create digital information for instructional purposes in an easier and efficient way. Their task is simplified by this software as they group technological tools for communication, course content and grade book management.” (p. 1)

According to Pollack (2003), “Course Management Systems can be used as a vehicle to deliver a course online or as a supplement to the learning process for a traditional face to face course” (p. 225).
One of the constant challenges for faculty members is to create an interactive environment where all students can enjoy equal freedom to interact with each other as well as with the instructor. Many times in face-to-face classes, discussions and interaction sessions are dominated by the students who enjoy greater linguistic skills and who are not shy about expressing their views in the open. Students with timid personalities or who are linguistically challenged may face problems in participating in class discussions. This is particularly true for the international students who are increasingly populating American universities. LMSs can effectively tackle this interaction problem. Instead of focusing only on in-class discussions, instructors can also organize online Internet-based discussions where students can post their opinions, read opinions posted by other students, and even give immediate feedback. Various LMSs also offer moderated chat sessions, where students can interact with instructors online. These activities encourage students’ participation in interactive and collaborative learning since writing in discussion board gives enough time for all students to think, organize thoughts, and express them effectively in a written format, especially students who otherwise would find it difficult to participate in face-to-face discussions. As Dabbagh (2000) reported, LMSs are a medium to promote collaborative learning, enhance critical thinking skills, and give all the students an equal opportunity to express their views. And for e-learning, LMSs enable institutions to develop electronic learning materials and to generate student databases in which students’ results and progress can be charted (Paulsen, 2003).

The use of LMSs in addition to student-teacher interaction has also taken steps forward by tapping into the traditional administrative process of the student-
university interaction. Nowadays, advanced LMS software are streamlining the process of education by incorporating administrative functions such as student registration, student records, grade book maintenance, identity management, and authentication. (Lynch, 2002).

LMSs commonly used today are available in different platforms, either as commercial products (for example, WebCT, Blackboard, Intralearn), open-source projects (for example, FLE, http://fle3.uiiah.fi/), or customized software systems that serve the instructional purposes of particular organizations (Avgeriou et al., 2003). As Brown (2002), put it, all of these LMS options are basically similar in function: they are designed to enable instructors to implement an educational philosophy in their teaching. For example, let’s look at Blackboard, one of the prominently used LMSs. According Pollack (2003), “Blackboard Learning System is currently in use at more than 2,000 academic institutions for online, Web-enhanced or hybrid courses” (p. 226). This system was developed to provide instructors and students with a feature-rich learning environment, pedagogical flexibility, and complete control of the course design and unmatched ease of use (Blackboard.com/highered, 2003). Blackboard also claims that the system can be used to measure and improve students performance, increase instructors productivity, enable “Web-enhanced” classroom-based teaching and learning, deliver distance learning, blend face-to-face and online learning techniques, leverage technology in order to enhance institutional competitiveness, and provide a framework for institutions to manage digital assets and content (Blackboard.com).
While Blackboard is the most commonly used, there are various other software packages available such as WebCT, FirstClass, TopClass, and ClassFronter. Even though these packages are developed by different groups of researchers, their major goal is a common one: to help faculty as well as students achieve excellence in education. All these LMS software packages are designed to perform various tasks, from teaching tools—such as online tests, distribution of materials, running discussion boards and chat sessions—to administrative tools—such as streamlining registration, maintaining the grade book, etc. Even though at the beginning these software systems were short and simple to use, with the addition of extra features LMSs have become mammoth and complicated. And while the advantages of these software packages are clear, in order to utilize them to their fullest one needs considerable technical knowledge and considerable hardware support, such as servers with huge capacity for storage as well as speed for data transfer, Internet access, and computers for all students.

Despite LMSs’ obvious advantages in teaching the acceptance of LMSs in the instructors’ community is far from complete. As more and more educational institutes opt for using LMSs in their teaching, it is essential to study the perceptions, experiences, and views of instructors who actually implement LMSs. Moreover, It is necessary for researchers to study the problems faced by the instructors so as to make the experience of using LMSs better for both instructors and students.

The following section will discuss the literature which focuses on diffusion of LMSs in higher education.
**Research Related to Diffusion of LMSs in Higher Education**

Since most educational institutions are using some form of a LMS, various researchers have studied different issues related to the instructors' use of LMSs in their teaching. At the beginning of this section, the major issues faced by the instructors are mentioned, which are discussed in detail later. The major issues in the research include:

- Lack of appropriate training or appropriate support to instructors from the educational institutions.
- Factors responsible for instructors' use of certain tools of LMSs and rejection of others.
- Factors responsible for the encouragement and discouragement of instructors' use of LMSs.

**Discussion of research related to the above issues**

*Importance of technical support*

The careful study of relevant literature presented some of the major discouraging factors faced by LMSs users. The prominent factor was a technical barrier, and one needs to understand that individual instructors will have his/her own limitations for using technology in the classroom. Even though at the beginning LMSs were relatively simple to use, recent advances like the inclusion of various tools and options designed to perform different tasks, such as grade books, assignments, discussions, have made LMSs considerably complex systems. Until and unless instructors are trained comprehensively, they are likely to find using
LMSs an overwhelming experience. Daugherty and Funke (1998), who conducted detailed research on faculty members’ as well as students’ use of LMSs, mentioned that faculty members expressed problems such as technical support, lack of incentive, and lack of suitable hardware and software equipment as their primary inhibitory factors. In the author’s own words, “there were few faculty members who, despite affirmative responses, cited concerns about the time expenditure required, wanting to see if technical barriers could be removed, and wanting more training or experience” (p. 29).

A strong relationship has been demonstrated by various researchers between the technical training faculty members receive and the extent they use LMSs. Training sessions are generally designed to help instructors feel comfortable assimilating new technology in their teaching, and since the advanced LMSs such as WebCT GOLD and Blackboard offer numerous tools, it is essential to provide proper training to the instructors so that not only do they know how to use these tools but that they also understand the benefits they can extract by using these tools in the field of education. Some of the LMS tools such as grade book and file manager are designed to reduce instructors’ workload and to make instructors more efficient, while tools such as discussions and chat are designed to encourage collaborative learning.

In order to extract full utilization of any LMSs, it is necessary for the instructors to use as many tools as possible, but without proper training sessions they may find it difficult, especially if the time requirement to learn these tools is significant. In other words, supporting LMS adopters is a crucial factor for
establishing LMSs in an educational system (Signer et al., 2002). The study conducted by Singer highlighted the need as well as the benefit of providing LMS training sessions for faculty members. Her research group surveyed faculty members twice in a period of two years, and in between the survey some of participating faculty members’ attended various LMS workshops and training sessions. The comparison between these two surveys strongly indicated the benefits of the training sessions. Burgler’s research (2006), also demonstrated the benefits of technical support and training sessions for faculty members using LMSs at ISU. In Burgler’s study it was found that more than half of the faculty members reported having adequate technical support, and the research indicated that if faculty members get adequate satisfactory technical support to carry out their distance education courses, they feel more comfortable using LMSs. Moreover, the research conducted by Morgan (2003) also supported the favorable relationship between faculty training and their incorporation as well as continued use of LMSs. In her study, 29% of the faculty and instructional staff that were survey stated that LMS training was an important factor in their initial adoption or expanded use of LMSs.

Instructors’ reluctance of full utilization of LMS tools

As stated earlier, to extract the full benefits of any LMS, such as WebCT GOLD and Blackboard, one needs to use as many tools as possible. Relevant literature suggests that most instructors utilize only a limited number of tools for various reasons. WebCT GOLD alone offers 20 different tools that are designed to make teaching more efficient as well as to encourage communication among
students and their instructors, but various studies indicate that only certain tools are favored by instructors, while other tools are ignored. For instance, Yohon et al. (2004) found that the most of the surveyed faculty member in his study at Colorado State University were using only a few LMS tools, such as maintaining grade books and offering online tests:

A closer look at what WebCT tools are used reveals that WebCT’s website publishing tools (such as content page syllabus and presentation distribution tools) are most used, while the interactive tools (such as chat, group presentations and discussions) were seldom used. (p. 317)

One more fact that came to light through Yohon’s research is that even five years after introducing WebCT at Colorado State University, only two-fifths of the faculty were actually using WebCT, indicating that this new technology was not getting adopted by faculty members fast enough. A study conducted by Pajo and Wallace (2001) also reflected the same scenario in Massey University in New Zealand. Pajo and Wallace mentioned that the time required to learn how to use Web-based technology and develop appropriate courses, along with continuing time requirements associated with using Web-based technology in teaching, were the major barriers reported by faculty members.

Encouragement and discouragement factors of using LMSs

From the earlier studies, it seems that LMSs are used more frequently to increase faculty members’ productivity versus being used to increase students’ opportunity for higher order learning or more active student-centered teaching
strategies. According to Sand Holtz, Ring Staff, and Dwyer (1994), the real benefit of technology use as an instructional tool is as a “medium for thinking, collaborating, composing, and communicating” (p. 1). Thus, it is essential to analyze the reasons behind why certain tools, especially the ones increasing instructors’ productivity, are favored more by instructors as compared to the tools that promote collaborative education. In addition to increasing instructors’ productivity, there are various other encouraging factors which encourage instructors to incorporate LMSs in their teaching. Morgan (2003) has mentioned three categories of pedagogical reasons for using LMSs by the instructors at the University of Wisconsin: a) supplementing course materials to increase student understanding, b) increasing faculty-student and student-student communication, and c) providing greater feedback to students to enhance their learning.

Since various studies have demonstrated weak LMS adoption by faculty members, one also needs to analyze the factors that discourage instructors from including LMSs in their teaching. As LMSs are getting more and more complex, the required time to keep up with various LMSs tools is increasing. If instructors feel that the time commitment for incorporating a LMS to its full extent is too overwhelming, they will shy away from either certain tools of LMSs or from LMSs as a whole (Pajo & Wallace, 2001). Morgan (2003) also described the inflexibility of LMSs, reliability issues, and students’ concerns as a few other major discouraging factors for instructors incorporating LMSs in their teaching. On other hand, she described training sessions and environmental issues, such as saving paper, as factors encouraging LMS use.
It is essential to study these encouragement and discouragement factors to get a complete picture of the problems faced by instructors as well as the incentives needed to encourage instructors to incorporate LMSs in their teaching. Analyzing the discouragement factors can also help LMS support staff organize training sessions specifically targeting concerns expressed by the instructors. This analysis can also help LMS designers to make modifications in the software itself to improve the interface according to instructors’ concerns or suggestions.

Iowa State University introduced WebCT GOLD in 2001, and every year more and more instructors are incorporating WebCT in their teaching. In order to achieve full utilization of WebCT in educational pedagogy, it is essential to analyze instructors’ views and experiences with using WebCT. This study will offer important information for LMS support staff, WebCT GOLD developers, as well as university administrators about how to make the WebCT GOLD experience better for everyone.

Summary

Although some faculty members do not adopt LMSs in their teaching, research results suggest that LMSs have various advantages and provide exciting tools that help both faculty and students. For example, LMSs can help students by making course material more streamlined and available at any time on Web servers, by saving students’ time, by offering students the option of distance education, and by offering students a platform where they can communicate with each other more effectively using various LMS tools. For faculty members, adoption of LMSs can help
save time by using certain LMS tools such as automatic grading and can help facilitate communication with the students using tools such as chat rooms, discussion boards, and e-mails. But despite such advantages, LMS adoption in the faculty community is still limited. In addition, even where LMSs have been adopted, there is a strong bias among faculty for certain tools over others. I believe that analyzing the factors that make instructors increase or decrease the use of LMS and the factors that make them use only certain tools of LMS will help educators, university administrators, and developers of LMS make necessary improvements and design support programs that can help create wider acceptance of LMSs and their tools in the faculty community. I believe that the research survey designed for this study will give us satisfactory answers to the above mentioned problems.
CHAPTER 3. METHODOLOGY

The purpose of this study was to seek information about WebCT users’ views on and experiences in using WebCT GOLD at Iowa State University. This chapter describes the research design used, followed by the information about the subjects, instrument, procedure, data collection, and analysis.

Research Design

A blended method was used for data collection. For quantitative data, single-answer questions (choices were given, but subjects were allowed to select only one), multiple-choice answer questions (“select all that apply”), and four-point Likert-scale questions (strongly disagree to strongly agree) were used, while qualitative data was collected through open-ended questions. The Likert scale was used to seek opinions from the WebCT GOLD users about the factors that encourage and discourage them in using WebCT GOLD. This Likert scale also included a fifth option of “not applicable,” and those who chose “not applicable” were, in effect, choosing not to answer the question, so those selections were treated as a non-responses.

Two open-ended questions were asked in the survey. The first question gathered information about the users’ most valuable WebCT GOLD tool or tools. The respondents were also requested to mention their reason or reasons for selecting those tools. The second question aimed to gather information about the participants’ use of WebCT GOLD in the fall 2007 semester as compared to the previous semester. Respondents were asked to explain their reasons for either
increased, decreased, or no change in their use of WebCT GOLD in the fall 2007 semester as compared to the previous semester.

Subjects

The participants were approximately 1,900 individuals on the list of WebCT GOLD users at Iowa State University. The participants were either faculty members, teaching assistants, academic support staff, or others using WebCT for administrative purposes, and participants represented a variety of disciplines and departments. Students using WebCT GOLD were not included in this study.

Instrument

After reviewing the relevant literature, the major goal for the pilot study was identified: examining users’ views about and experiences in using WebCT GOLD. Four types of questions were used: single answer (choices were given, but participants were allowed to select only one), multiple-choice answer (“select all that apply”), four-point Likert scale (strongly disagree to strongly agree), and open-ended. Questions were constructed in order to seek demographic information about WebCT users, their views on some of the encouraging and discouraging factors in using WebCT GOLD, the WebCT GOLD tools that participants routinely use, and participants overall use of WebCT GOLD in the fall 2007 semester as compared to the previous semester.

In the survey, participants were asked two open-ended questions (see Appendix A). The first question gathered information about participants’ reasons for
preferring certain WebCT GOLD tools over the others, while the second question was designed to collect information about participants’ overall usage of WebCT GOLD in the fall 2007 semester as compared to their earlier semesters.

Before distributing the survey to the pilot group, the instrument was evaluated by a few faculty members at Iowa State University. As a result, some of the survey questions were reworded according to faculty members’ suggestions. For example, in the ninth question of the survey, the first option originally read as “it was supported by the university,” which was corrected according to the suggestion to “the university supports it.” In addition, the tense of various sentences was changed from passive to active in response to the reviewers’ suggestions.

**Pilot survey delivery**

The pilot draft of the survey was given to a group of teaching assistants who taught Biology 211 L and 212 L at Iowa State University. The total number of teaching assistants who responded to the pilot study instrument were 22. Many of the respondents made grammatical corrections to the survey questions. The survey was again modified based on the suggestions made by the pilot respondents.

This revised draft of survey was then reviewed by Center for Learning and Teaching (CELT) staff at Iowa State University, who are actively involved in WebCT problem solving. Based on the CELT staff’s comments, the survey was revised many times before the final draft was completed, including moving the demographic questions to from the end of the survey to the beginning of the survey to improve the organization of the instrument.
One of the important contributions made by CELT staff was providing the titles of the WebCT GOLD tools. A question in the survey asked respondents to select the tool or tools they routinely used, and the CELT staff completed the list of available tools because some tools, such as Roaster and SCORM, were not initially included. Suggestions for additional questions to gather demographic data and background information were also received and modifications were made accordingly. For example, the following questions were added to the survey as per the recommendations: “Learning Management Systems I have used before….” and “The browser/s I used the most often to access the Internet is/are….”

**The final survey**

The final instrument for this study was a Web-based survey with 21 questions. The Respondus tool was used to create the survey, and WebCT Gold was used to deliver the survey. A course titled “ISU Faculty WebCT GOLD Survey” was created on WebCT GOLD, and all the potential participants were enrolled in the course. The survey was then uploaded from Respondus to the “ISU Faculty WebCT GOLD Survey” course to give access to all the participants. After each participant completed the survey, the responses were saved anonymously in WebCT GOLD. WebCT GOLD offers an “announcements” tool, which allows course administrators to create announcements members using WebCT. This announcements tool was used to deliver a message to the subjects about the survey, the reasons for subjects’ selection as a participant, and subjects’ rights as a participant. Then, after a couple of weeks, a reminder announcement was sent to all
participants requesting that they complete the survey if they had not yet done so. A similar e-mail was also sent on both the occasions using Iowa State University’s WebMail server.

**Data Collection**

The data collection process occurred over the period of approximately four weeks, September 25 through October 19, 2007. The first contact with participants was an introductory e-mail to all the subjects on the WebCT GOLD user list. This message was also delivered to all subjects as an announcement via the WebCT GOLD announcements tool. This first message informed participants about their enrollment in the “ISU Faculty WebCT GOLD Survey” course, the reasons for requesting their participation, and their rights as a participant. After the first e-mail was sent, 80 participants completed the survey the very first day, and around 40 of the possible participants replied they were not eligible to take the survey for various reasons: they were not working at ISU anymore; they were not a teaching assistant in the fall 2007 semester, etc.

Two weeks later, a reminder e-mail and an announcement on WebCT GOLD, was sent to all the participants, which resulted in increased participation. In the end, 346 participants completed the survey.

**Data Organization and Analysis**

Data was exported from WebCT GOLD into an Excel spreadsheet. All the cell values were replaced as numerical values using the “replace” function of Excel, and
the data was organized in Excel, where each response was given its own column. The responses from “select all that apply” questions were separated into different columns. Similarly, each Likert-scale question was given a separate row. The responses “strongly agree,” “agree,” “disagree,” and “strongly disagree” were each put into separate columns and coded 1, 2, 3, and 4 respectively. Other non-Likert questions were similarly coded and separated in Excel. For example, in the question that asked for participants’ proficiency level “novice” was coded 1, “intermediate” was coded 2, “advanced” was coded 3, and “expert” was coded 4. Later, the data were exported to SPSS and the following statistical procedures were used to analyze the data: Scores generated by the Cronbach’s alpha test were used to support reliability of the survey; descriptive statistics was used for demographics; and the cross tabulation test was used to compare routinely used WebCT GOLD tools with different parameters of the users such as their position, their age group, and their prior experience in using WebCT GOLD.

Along with the quantitative survey questions (objective multiple choice), respondents were also asked two open-ended questions to collect detailed information about their views of and experiences in WebCT GOLD. The first question gathered information about the tool or tools users found the most valuable and their reasons for the selections. The second open-ended question gathered information about the reasons for users’ increase, decrease, or no change in their use of WebCT in the fall 2007 semester as compared to the previous semester.

In order to analyze the responses received from the open-ended questions, the responses were downloaded to an Excel spreadsheet, and these responses
were read multiple times to identify common and prominent themes. For example, in the case of the second open-ended question, common themes identified for the reasons of decreased use of WebCT GOLD were reduced course load, technical difficulty, preferred alternative for WebCT GOLD, etc. These common themes were later separated and coded numerically. For instance, all the responses that mentioned reduced course load as the reason for decreased WebCT GOLD use were coded 1, while all the responses that mentioned technical difficulty as the reason for decreased WebCT GOLD use were coded 2. Again, the common themes were identified and represented in a long discussion in a sequential and organized manner. Also, selected quotes from the responses representing these themes were included in the results to support the discussion. Similarly, the reasons for increased and no change in participants’ use of WebCT GOLD were identified, coded, and represented in the results. The same approach was followed for the other open-ended question.

**Summary**

This chapter discussed the subjects, creation and delivery methods of the pilot and final instrument, along with the data collection, organization, and analysis methods. Twenty two teaching assistants from the biology department who were using WebCT GOLD as instructors at Iowa State University were identified for the pilot subject population, and the survey was first tested on this group. Suggestions and comments from the pilot group as well as from CELT staff led to multiple revisions until the final survey was delivered to the subjects. Data was collected
using WebCT GOLD, organized in Microsoft Excel, and analyzed using SPSS software. The next chapter will describe the results of the final survey.
CHAPTER 4. RESULTS

A summary of the results from this study is included in this chapter, beginning with methods to predict the reliability of the survey. Descriptive statistics are provided in the demographics section, which describes the characteristics of the respondents. The second part of the chapter provides information on the respondents’ reasons for increasing, decreasing, or making no change in their use of WebCT GOLD in the fall 2007 semester as compared to the previous semester. The next section provides detailed information on the respondents’ views of WebCT GOLD tools they find the most valuable, which is followed by cross tabulation analysis to compare respondents’ usage of WebCT GOLD tools with their different demographic parameters.

Reliability

In order to determine the reliability of the survey, Cronbach’s alpha was used to determine the internal consistency estimated of the Likert-scale questions. Thirty-six of 79 questions in the survey could be included in this analysis. The Cronbach’s alpha of these items was .768. (See Figure 1.)

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.768</td>
<td>36</td>
</tr>
</tbody>
</table>

*Figure 1. Results of item analysis for Likert-scale items.*
According to the article in *SPSS for Windows Step by Step: A Simple Guide and Reference* (George & Mallery, 2003), a Cronbach’s alpha of greater than or equal to .7 is considered acceptable (p. 231). This guideline suggests an acceptable reliability for the Likert-scale items in this study.

**Demographics and Background Information**

The survey was delivered to 1,900 individuals who had used WebCT before the fall 2007 semester. Of the 1,900 surveyed, 346 responded. The typical respondent was a female faculty member between the age group of 25 to 36 years who was teaching undergraduates in the College of Liberal Arts and Sciences. Most of the respondents, around 55%, were female.

Table 1.

*Gender reported (actual number of responses)*
Table 2.

*Teaching ranks reported (actual number of responses)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>193</td>
</tr>
<tr>
<td>Teaching assistants</td>
<td>72</td>
</tr>
<tr>
<td>Academic support staff</td>
<td>21</td>
</tr>
<tr>
<td>Others</td>
<td>57</td>
</tr>
</tbody>
</table>

Table 3.

*Teaching levels reported (actual number of responses)*

<table>
<thead>
<tr>
<th>Level</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>285</td>
</tr>
<tr>
<td>Graduate</td>
<td>126</td>
</tr>
<tr>
<td>Certificate program</td>
<td>10</td>
</tr>
<tr>
<td>Non degree program</td>
<td>7</td>
</tr>
<tr>
<td>Workshop</td>
<td>16</td>
</tr>
</tbody>
</table>
Table 4.

*Teaching departments reported (actual number of responses)*

<table>
<thead>
<tr>
<th>Department</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and Life Sciences</td>
<td>52</td>
</tr>
<tr>
<td>Business</td>
<td>21</td>
</tr>
<tr>
<td>Design</td>
<td>15</td>
</tr>
<tr>
<td>Engineering</td>
<td>42</td>
</tr>
<tr>
<td>Graduate</td>
<td>9</td>
</tr>
<tr>
<td>Human Sciences</td>
<td>55</td>
</tr>
<tr>
<td>Liberal Arts and Sciences</td>
<td>124</td>
</tr>
<tr>
<td>Veterinary Medicine</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 5.

*Age group reported (actual number of responses)*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or less</td>
<td>44</td>
</tr>
<tr>
<td>26 to 35</td>
<td>99</td>
</tr>
<tr>
<td>36 to 45</td>
<td>83</td>
</tr>
<tr>
<td>46 to 55</td>
<td>63</td>
</tr>
<tr>
<td>Above 55</td>
<td>50</td>
</tr>
</tbody>
</table>
The respondents were asked to select all the options for using WebCT GOLD in their teaching (more than one response could be selected), and it was seen that the majority of the respondents reported that they used WebCT GOLD as a tool for “supplementing face-to-face courses” (86%) as compared to the other available options in the survey, which were using WebCT GOLD for “online/distance courses” (16%) or for “other” purposes (10%).

When asked about respondents’ prior experience of using any LMS, it was seen that most of the respondents had used WebCT Cardinal (an older version of WebCT) followed by Blackboard. LMSs such as Desire2Learn, Angel, Moodle, and eCollege were hardly used.

To identify the major reasons for respondents’ use of WebCT GOLD, they were asked to select all of the reasons they use WebCT GOLD (more than one response could be selected). It was seen that the majority of the respondents (68.20%) reported that they use WebCT GOLD due to the fact that ISU supports the use of WebCT GOLD, followed by respondents (42.77%) who said it was their own decision to use WebCT GOLD. Twenty-seven percent said that they were using WebCT GOLD due to the recommendation of WebCT GOLD from their peers, while 10% of respondents reported their use of WebCT GOLD due to the fact that their students requested it.

Table 6.

*Reasons for using WebCT GOLD reported (actual number of responses)*
In the study, five potential factors that may encourage users to use WebCT GOLD and five potential factors that may discourage them from using WebCT GOLD were listed. The respondents were asked to rate those factors on a Likert-scale (strongly agree, agree, disagree, strongly disagree, not applicable), 1 being strongly agree, 2 being agree, 3 being disagree, and 4 being strongly disagree. Not applicable was considered as no response.

The five encouragement factors stated in the study were 1) “I can finish my course related tasks more efficiently when I use WebCT GOLD;” 2) “The training sessions/ workshops I attended at ISU increased my use of WebCT GOLD;” 3) “WebCT GOLD saves me time while completing course related tasks;” 4) “The easy accessibility encourages me to use WebCT GILD more often;” and 5) “The use of WebCT GOLD promotes my students’ communication with me.”

The five discouragement factors stated in the study were 1) “While using WebCT GOLD, I face many hardware and software problems;” 2) “I work too hard to build my course in WebCT GOLD;” 3) “The average response time of WebCT GOLD
during the last semester was slow;” 4) “My students find WebCT GOLD difficult to use;” and 5) “I feel the students with better knowledge of computers get an unfair advantage using WebCT GOLD.”

Average scores for encouragement factors

For the encouragement factors one, two, four, and five, the average weighted score indicated that a typical ISU respondent agreed with these are encouraging factors for the use of WebCT GOLD, while a typical ISU respondent strongly agreed that factor 3 is an encouragement for using WebCT GOLD. (See Figure 2)

<table>
<thead>
<tr>
<th>Encouragement Factors</th>
<th>Average Weighted Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can finish my course related tasks more efficiently when I use WebCT GOLD</td>
<td>2.21</td>
</tr>
<tr>
<td>The training sessions/ workshops I attended at ISU increased my use of WebCT GOLD</td>
<td>2.08</td>
</tr>
<tr>
<td>WebCT GOLD saves me time while completing course related tasks</td>
<td>1.39</td>
</tr>
<tr>
<td>The easy accessibility encourages me to use WebCT GILD more often</td>
<td>2.06</td>
</tr>
<tr>
<td>The use of WebCT GOLD promotes my students’ communication with me</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Figure 2. Average weighted scores for encouraging factors.
Average scores for discouragement factors

For factors one and three, the average weighted score indicated that a typical ISU respondent agreed that these factors are discouraging factors for the use of WebCT GOLD, while for the factor two, four, and five, a typical ISU respondent disagreed that these factors are a discouragement for using WebCT GOLD. (See Figure 3)

<table>
<thead>
<tr>
<th>Encouragement Factors</th>
<th>Average Weighted Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>While using WebCT GOLD, I face many hardware and software problems</td>
<td>2.44</td>
</tr>
<tr>
<td>I work too hard to build my course in WebCT GOLD</td>
<td>2.52</td>
</tr>
<tr>
<td>The average response time of WebCT GOLD during the last semester was slow</td>
<td>2.23</td>
</tr>
<tr>
<td>My students find WebCT GOLD difficult to use</td>
<td>2.74</td>
</tr>
<tr>
<td>I feel the students with better knowledge of computers get an unfair advantage using WebCT GOLD</td>
<td>2.57</td>
</tr>
</tbody>
</table>

Figure 3. Average weighted scores for discouragement factors.

Justifications for the Increased, Decreased, or No Change in WebCT GOLD Usage

The survey included a question seeking information about whether respondents' WebCT GOLD usage had increased, decreased, or remained the
same in the fall 2007 semester as compared to the previous semester. Table 7 summarizes the results of this question and indicates that overall usage of WebCT GOLD has definitely increased in the fall 2007 semester as compared to the previous semester. Forty percent of the respondents mentioned that their WebCT GOLD usage had “increased” in the semester of fall 2007. On the other hand, 16% of the respondents selected “decreased,” and 38% selected the “remained the same” option. The following discussion includes some of the respondents’ comments explaining their reasons for the change in their WEBCT GOLD usage.

Table 7.

<table>
<thead>
<tr>
<th>WebCT GOLD Usage in fall 2007 as compared to previous semester reported.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased, 40%</td>
</tr>
</tbody>
</table>

WebCT GOLD offers around 20 different tools to support efficient teaching, and various respondents mentioned that their use of WebCT GOLD increased in the
fall 2007 semester because they were using additional tools as compared to the previous semester. For example, one respondent commented, “I am making increasing use of online assessments to save in-class time and grading effort. For the first time I am monitoring the discussions as well,” while another respondent said, “this is only the second semester I have used the page, but I am working to put more activities and resources online for the students. I ask them to deliver all their e-mails to me here, and I am using the discussion option more often.” One more interesting comment received in the survey was, “This semester, I am creating own folders to post my lecture notes, announcements, quiz answer keys, etc.”

It appeared from the comments that the respondents who had increased their use of WebCT found the technical support provided by the university invaluable. One comment which supported this was, “this was the first semester that I used WebCT GOLD. Previously I used WebCT Cardinal and was reluctant to switch, but I find features of WebCT GOLD easier. I have great support from our college staff.” Another respondent emphasized the importance of WebCT workshops offered by the university: “Last semester I used WebCT for the grade book only and maintained a separate course Web site. After taking some WebCT [introduction] classes, I decided there was no reason not to consolidate everything onto WebCT.”

WebCT GOLD is a great tool for the instructors who teach online/distance courses, so it was no surprise that a substantial percentage of the respondents who had increased their use of WebCT in fall semester 2007 were involved in distance education, illustrating the important role WebCT plays in distance education. One respondent specifically explained the reason for increasing WebCT use as “I am
teaching an online course this semester." It seems that students’ demand for online courses is also playing an important role in the increment in usage of WebCT GOLD. For instance, one respondent who had increased WebCT GOLD usage commented that “more and more courses are being put online due to the increased demand by students for credit and non-credit offering.”

In addition, one interesting comment indicated that sometimes the respondents had increased their use of WebCT despite having some reservations about the system since WebCT since they lacked LMS alternatives:

I chose to move my orientation to predominantly online and WebCT GOLD was the perfect tool to do this. Students submit assignments and assessments online and I grade them online. While I believe there is a lot of room for improvement, WebCT GOLD is the best we have for right now…. and it is lot easier to use than WebCT Cardinal.”

A sizeable portion of the respondents mentioned that they had selected the “increase” option for WebCT usage in the fall 2007 semester because it was their first semester using WebCT GOLD. On other hand, a few respondents also commented that even though they were not using any additional tools of WebCT GOLD, their WebCT GOLD usage had increased because of an additional course load.

As shown in Table 7, 16% of the respondents decreased their WebCT GOLD usage in the fall 2007 semester as compared to the previous semester. Even though some respondents had selected this option only because of a reduced course load,
some made articulate comments explaining their negative experiences with WebCT GOLD that caused them to decrease usage.

From the comments received in the survey, it seemed that some respondents faced difficulty in changing from the earlier version of WebCT, Cardinal, to the latest version, GOLD. One comment was, “I was much familiar with Cardinal and found it more intuitive to use. GOLD has been a bit of a conundrum for me,” while according another respondent commented, “I use it less because I hate it. I used Cardinal all but one semester that both GOLD and Cardinal were available. I dreaded having to go back to GOLD, but it is all there is, so what can I do.” In addition, some respondents complained about various technical difficulties they encountered while using WebCT GOLD. For example, one respondent said, “I have decreased my use because WebCT is unacceptably slow,” while another made the following complaint:

When GOLD first came out, we had students submit assignments on WebCT and the problems associated with students’ understanding /hardware /software issues made this process a time consuming nightmare. The slowness in the loading mechanism to view and grade these assignments was a nightmare. We will never use that again, and they are submitting all assignments on paper, unfortunately, because we do not have the staff/time to use the WebCT system. Even now with the grade book it is much too slow and time consuming but we are still continuing to use that piece.

Moreover, some respondents seemed to be disheartened by WebCT GOLD’s slow loading process. For example, one respondent said, “It is very slow loading, clunky. My students especially dislike the e-mail utility, which forces them to open a
separate and slow program to read e-mail." Another comment emphasized the software problems: “WebCT is cumbersome, the interface is terrible and non intuitive. WebCT is often very slow.”

Some of the respondents who had decreased their use of WebCT GOLD advocated for other interactive software that they found more effective and useful than WebCT GOLD. The above comment continues in “(instead of using WebCT) this semester I am using Facebook and it has been easier to use.” Another respondent commented, “the course I am teaching has its own Web site, therefore I work more on that Web page than WebCT.” In addition, some respondents mentioned that they had moved away from WebCT because their students had expressed dissatisfaction with using WebCT:

I think WebCT is a very poorly designed system. Very fancy looking but offering too many options that makes it complicated and inefficient. It has huge security holes (like a TA being able to modify any score). Entering grades by hand is a painful process. The speed issue is nerve racking. Sometimes figures or parts of problems disappear mysteriously. We used it a lot for machine graded problems, and the system is very sensitive to the format of the answer. All in all, students got very frustrated with the particularities of the system, its somewhat random behavior. WebCT is unreliable and students end up feeling very insecure about everything related to it. (Did I get credit for the problem I submitted? Are my points well added? Did this score in my grade book change from what I had last week?). I can go on for pages… I can’t believe the university is paying money for this. The
support staff is easy to reach but often are not able to solve the problem (I end up finding a way out first) and sometimes would blame problems on me (especially last semester, when I guess they got a little defensive because everybody must have been complaining). I think the cherry on top was finding out that WebCT couldn’t work with the newest Java version, so we were all supposed to disable Java updates. I had to revert to a rationally designed system developed by the physics department at the University of Illinois at Urbana-Champaign and it is working wonderfully. My students are delighted, my TAs are delighted. The only item I miss from WebCT is the discussion board.

Thirty-eight of the respondents reported that their WebCT GOLD usage for the fall 2007 semester did not change as compared to the earlier semester. The same course load was the reason given by many of the respondents, but one can infer that even with after gaining more experience, these respondents were not utilizing any additional tools in WebCT GOLD. In fact, various comments in the survey suggest that some of the respondents had not increased the WebCT usage because of some unpleasant experience they encountered earlier semesters. According to one comment, “the interface with WebCT is horrible. I never know whether I am supposed to be in Teach or Build mode. It takes for ever to upload files and then even longer to rearrange them in some kind of outline that is findable for the students,” and a second respondent said, “I have thrown up my hands and let my research assistant do it all because I loathe WebCT so much. I wish the
university would switch platforms. I just map a new course from an old course each semester, so my time spent on WebCT is about the same."

Other respondents had not increased the WebCT usage because of the slow response they encountered in the program. For instance, one respondent said, "every aspect of WebCT is somewhat cumbersome. The response time is especially frustrating at times. Entering equations in the grade book is horrendously tedious," while another comment echoed the sentiment:" WebCT GOLD is a mess of software glitches, crashes, frozen sessions, incompatibilities and slow, slow, slow response."

According to this last commenter, the GOLD version is even slower than the Cardinal version, and he wished he could switch back. He said, “It is depressing to think that the university is actually paying money for this defective system and foisting it on the faculty."

Moreover, some respondents who hadn’t increased their usage cited a lack of time to learn the WebCT GOLD’s new tools. One comment was, “I haven’t had time to learn anything new. I know that there are many other capabilities that I haven’t tapped, but I haven’t had time to explore that,” while another comment read, ” I know there are many more tools that I could take more advantage of but I don’t have time to rework my classes to use those tools.”

One more prominent reason that respondents did not to increase WebCT usage was their difficulty in utilizing various tools. There are around 20 different tools in WebCT GOLD, and users must know various menus and functions in order to make full utilization of each. If a user finds it difficult to employ certain tools then
naturally he or she will avoid using it, which was precisely what was stated by some respondents. For instance, one comment said the following:

I am aware that I use only limited tools of WebCT but my perception is that the learning curve is too steep for it to be worth my while to attempt more complicated functions, such as assessments via WebCT. I would be interested in doing that if it was easy to set up.

Another comment expressed much of the same sentiments:

I am using it the same way but seriously, today alone, I am really annoyed. I have created an assignment three times and it is still not there. Really. What the hell? I think we need another system. My students are really ticked off about not being able to upload their assignments from their home computers and I am really ticked off about having to accept late assignments because I can’t be sure that it wasn’t a technical difficulty.

The above comment also emphasizes the need to tackle the question of how to differentiate between somebody who is really having a technical problem as compared to someone using it as an excuse to get additional time to complete the task.

From the comments received, it seemed that for some users WebCT GOLD was proving to be very helpful. These respondents tended to have increased their WebCT GOLD usage either by trying new tools or by using WebCT GOLD for additional courses. But, on other hand, a substantial percentage of the WebCT GOLD users seemed to be uncomfortable using the system. More research is needed to analyze whether the respondents who are using WebCT GOLD more
have a better technical aptitude, better hardware or software support, or better incentives from the university as compared to the respondents who are either decreasing their usage or maintaining same usage level. One important point that came up in the comments is that alternatives to WebCT GOLD are available to the faculty members and some of respondents are using alternatives with better results. More research will be required to evaluate the effectiveness of some of the alternatives mentioned by our respondents (Wiki, private Web pages, Facebook, etc.) as compared to WebCT GOLD.

**Respondents’ Comments on Their Most Valuable WebCT GOLD Tools**

Along with the survey questions where respondents were asked to select the WebCT GOLD tools that they had routinely used, respondents were also asked to provide comments about their most valuable tool. Results indicated that respondents strongly valued the grade book tool followed by discussion, assignments, assessments, announcements, and file manager. The comments made by the respondents strongly backed this trend. The approximate percentages were grade book (40%), discussion (17%), assignments (16%), assessments (13%), announcements (10%) and file manager (10%).

Respondents gave a wide variety of comments about the tools that they have used the most. One of instructors’ major tasks is to keeping students updated about their progress in the course throughout the semester, and the popular grade book tool of WebCT offers a tool in which instructors can upload grades and students can view their grades at any time. From the comments made by the respondents, it
seems that they have favored the grade book tool so heavily because of the valuable grading ability mentioned above. For example, one of the respondents commented, “I like students having access to their scores at all times,” while another said, “it keeps students informed about their status in the course.” One more comment is self explanatory: “[The grade book] helps communication tremendously as students can check WebCT GOLD and know exactly where they stand grade wise throughout the semester.” Respondents raised another interesting benefit of the grade book tool: by monitoring their grade, students are absolutely sure that their instructors have not inadvertently entered wrong grades in the grade book. For instance, one comment said, “The grade book is also a great way for the students to check and make sure I haven’t made any grading errors.” Some respondents also mentioned that the grade book allows them keep grades well organized and offers a reliable data storage system.

File manager is another WebCT tool that also offers instructors a place to store course information, and this tool was the second most popular tool among the respondents. According to the respondents, there are various advantages of the file manager tool. One of the most prominent reasons is that it offers a convenient location for instructors to store course related files that are always available for the students. Some of the respondents also praised file manager because it saves their time and paper (and money), as all the course related materials are available online: “File manager allows me to distribute materials (home work and their solutions, remarks on homework, scans of slides....) I otherwise would have to print.” Another comment said, “file manager makes it easier to share slides, articles, exam reviews
and exam keys with the students.” One more comment also suggested that the file manager tool saves users time since instructors have received less requests for materials, since the materials are always available online. Respondents reported that the file manager also saves time during class since instructors don’t have to waste class time distributing class material that are already online. Instead, instructors can ask students to bring class materials printed from home instead. In this way, the file manager offers instructors an effective and reliable way of sharing information. One comment said, “the file manager, or just the ability to put the course content on the Web, is a way to distribute information to all students reliably; no student can say they did not receive an e-mail.”

Along with the grade book and file manager, the other tools that were most frequently used by the respondents were assessments, assignments, announcements, and discussion. The announcements tool is used by instructors to post comments, instructions, and general announcements for the whole class. The instructors said that they like the announcement tool because they can post important notes to the students that can accessed at any time of the day. One respondent wrote, “(I like announcements) to send timely updates to [the] entire class,” while the another respondent wrote, “we always have announcements trying to get students involved in outside activities along with the remainders in regard to the class.” Instructors also praised the announcements tool because they didn’t have to e-mail general announcement to all the students. One of the most interesting comments about the announcement tool truly indicated the best advantage of the tool: “Announcement [sic] is useful since many of my students have other classes
using the Course Management System. That way, if I make an announcement using WebCT, they will see it when they log in for another class.” This means that whenever students log in to their WebCT account they easily notice announcements for all their courses that use WebCT. Thus, students don’t have to look at individual course folders to learn about new announcements.

The assignment tool allows students to submit their assignments online, and the feature is designed to save paper as well as the time required in face-to-face meetings for assignment collection. The tool also eliminates problems with submitting assignment due to e-mail server problems. Forty-eight percent of the respondents in this study favor the assignment tool. Most of the respondents find the assignment tool convenient since it eliminates face-to-face meetings for assignment submission, a tremendous help for instructors who teach online courses. For instance, one respondent wrote, “I like having students submit their work online and being able to grade their work online,” while another’s comments explained more about why the instructors like using assignment tool. The respondent said, “I really like that I can track who has submitted written assignments online and see when they turn them in. I like having the written assignments in electronic form because I can easily check word length, spelling, and use the Word track changes tool to write comments in the assignment to give back to students.” Instructors also found the tool convenient because the assignments sheets are always accessible to the students online, so instructors don’t have to entertain students’ repeated requests for the assignment questions or instructions.
Respondents also reported their preference for the assessments tool. In this WebCT GOLD tool, instructors can upload quizzes or tests that can be completed online and be automatically graded. Instructors said that using the assessments function allowed them to engage their students more efficiently. For example, one comment said, “I like the assessments function because I can do a challenging homework with each student getting a different assignment.” This is a very important advantage of the assessments tool. Instructors can create a pool of questions from which a specified number of questions will be randomly selected as a quiz for each student. Thus, every student will have a relatively different quiz.

The assessments tool seemed to be especially beneficial for instructors handling large classes since the quizzes were automatically graded: “(Assessments) greatly facilitates grading and grade recording in my large section of 300 students.” One of the drawbacks of this tool is that if instructors want to have a quiz automatically graded, the quiz can only include multiple-choice questions, but from the comments received and the percentage of instructors who use the assessments tool, it seemed that the advantages greatly outweigh the disadvantages of this tool.

In addition, the discussion tool received various favorable remarks. Instructors used this tool to post supplemental information, to provide Web links, to pose and respond to questions, etc. It appeared that some of the respondents had used this tool thoroughly and to great advantage. One comment said, “I have created dedicated student group discussion boards that faculty require students to use for group work. Faculty then monitor group progress via the discussion boards. Moreover, students feel safe using it knowing just members of their teams can see
posts.” The discussion tool is designed to increase student interactions among themselves and with the instructor, and from the comments it seems that this goal is achievable. For instance, one comment said, “discussion boards are handy for things that we aren’t able to get in class and allow students to engage with each other in an environment they are familiar with,” while another said, “the discussion board is the most valuable tool in my teaching because it allows me to interact with my students and for them to interact with each other.” Some respondents also mentioned that they like the idea of participating in discussion anonymously, so that students can interact without any hesitation. For classes that meet less frequently, the discussion tool is very advantageous for class interaction.

The response and the comments received for other tools were negligible. In particular, the WebCT GOLD tools of chat, SCORM, and Roaster received very poor response.

Relationship of WebCT GOLD Tools Used by the Respondents to Their Demographical Characteristics.

WebCT GOLD offers 20 different tools. In most of the reviewed literature it was seen that users of LMSs use only certain tools of the LMS, ignoring the rest. Therefore, this survey asked respondents to select the WebCT GOLD tool/s they routinely use to check which of the WebCT GOLD tools were the most frequently used at ISU. When respondents were asked to select all of WebCT GOLD tools they use, grade book (81%) was reported as the most often used WebCT tool, followed
by file manager (53%), announcements (50%), assignments (48%), discussion (42%), calendar (42%), assessments (33%), and e-mail (31%). (See Table 8)

Table 8.

*WebCT GOLD tools used routinely (actual number of responses)*

<table>
<thead>
<tr>
<th>Tool</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Announcements</td>
<td>174</td>
</tr>
<tr>
<td>Assessments</td>
<td>117</td>
</tr>
<tr>
<td>Assignments</td>
<td>167</td>
</tr>
<tr>
<td>Chat/White board</td>
<td>18</td>
</tr>
<tr>
<td>E-mail</td>
<td>119</td>
</tr>
<tr>
<td>Discussions</td>
<td>42</td>
</tr>
<tr>
<td>File Manager</td>
<td>145</td>
</tr>
<tr>
<td>Grade book</td>
<td>200</td>
</tr>
<tr>
<td>Group Manager</td>
<td>85</td>
</tr>
<tr>
<td>HTML editor</td>
<td>41</td>
</tr>
<tr>
<td>Learning Module</td>
<td>82</td>
</tr>
<tr>
<td>Selective release</td>
<td>82</td>
</tr>
<tr>
<td>Grading forms</td>
<td>22</td>
</tr>
<tr>
<td>Student Learning</td>
<td>18</td>
</tr>
<tr>
<td>Web Links</td>
<td>126</td>
</tr>
<tr>
<td>Roster</td>
<td>19</td>
</tr>
<tr>
<td>Media Library</td>
<td>66</td>
</tr>
<tr>
<td>Goals</td>
<td>20</td>
</tr>
<tr>
<td>Calendar</td>
<td>145</td>
</tr>
</tbody>
</table>

To evaluate whether the respondents’ use of any particular WebCT GOLD tool/s was dependent on respondents’ demographical characteristics such as their position, their prior experience of using of any type of LMSs, their proficiency level of using WebCT GOLD, their gender and age group, a two way contingency table analysis was used. A two-way contingency table (cross tabulation) analysis was conducted to evaluate whether respondents’ use of WebCT GOLD tools was related to their job position at the university. The two variables were the respondents’ position (faculty, teaching assistant, academic support staff, or other) and routine use of WebCT GOLD tool (0, 1). Zero was coded for respondents who did not select
that particular tool, while 1 was coded for the WebCT GOLD tool’s name (for example, assessments, assignment, or grade book, etc.) respondents had selected. Out of 20 WebCT GOLD tools, usage of assessments (Pearson $\chi^2 (3, N=337) = 14.52, p = 0.02$), file manager (Pearson $\chi^2 (3, N=337) = 9.343, p = 0.025$), and learning module (Pearson $\chi^2 (3, N=337) = 15.767, p = 0.001$) were found to be significantly different between different positions of the respondents.

This cross tabulation showed that among respondents, faculty members (30.6%) and teaching assistants (28.2%) were less likely to use the assessments tool as compared to the academic support staff (65%) and others (47.2%), whereas faculty members (61.7%) seemed to use file manager the most as compared to teaching assistants (46.5%), academic support staff (40%), and others (45.3%). This analysis also showed that among the respondents, 28% of faculty members, 8.5% of teaching assistants, 25% of academic support staff, and 23.5% of others used the learning module tool.

A two-way contingency table (cross tabulation) analysis was also conducted to evaluate if respondents’ prior experience with using any LMS has any relationship to their use of certain tools of WebCT GOLD. The two variables were respondents’ prior experience with using any LMS (less than 1 year, 1-3 years, 4-6 years, more than 6 years) and respondents’ routine use of WebCT GOLD tools (0, 1). Zero was coded for the respondent who did not select that particular tool, while 1 was coded for WebCT GOLD tool’s name respondents had selected. It was seen that the WebCT GOLD tools assessments (Pearson $\chi^2 (3, N=336) = 8.75, p = 0.033$), e-mail (Pearson $\chi^2 (3, N=336) = 17.960, p = 0.000$), discussion (Pearson $\chi^2 (3, N=336) = 17.960, p = 0.000$),
13.486, \( p = 0.004 \), grade book (Pearson \( \chi^2 \) (3,N=336) = 9.950, \( p = 0.019 \)), HTML editor (Pearson \( \chi^2 \) (3,N=336) = 10.495, \( p = 0.015 \)), and learning module (Pearson \( \chi^2 \) (3,N=336) = 16.585, \( p = 0.001 \)) were found to be significantly different between respondents with prior experience using any LMS. This cross tabulation results showed that respondents having prior experience of using any LMS for more than 6 years were more likely to use assessments, e-mail, discussion, HTML editor, and learning module than respondents with a less experience. It was also seen from the results that respondents with prior experience of 4-6 years were more likely to use the grade book tool the most.

<table>
<thead>
<tr>
<th>Selected Tool</th>
<th>Experience of using LMS/CMS in years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 1</td>
</tr>
<tr>
<td>Assessments</td>
<td>28.2%</td>
</tr>
<tr>
<td>E-mail</td>
<td>19.2%</td>
</tr>
<tr>
<td>Discussion</td>
<td>34.6%</td>
</tr>
<tr>
<td>Grade book</td>
<td>73.1%</td>
</tr>
<tr>
<td>HTML Editor</td>
<td>3.8%</td>
</tr>
<tr>
<td>Learning Module</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

*Figure 4. Cross tabulation percentage of respondents’ experience using different WebCT GOLD tools.*
This survey asked respondents to best describe their proficiency level (novice, intermediate, advanced, or expert) in using WebCT GOLD, and they were allowed to choose only one of the options to rate their proficiency level. The results showed that 56.94% of respondents reported themselves as intermediate in WebCT GOLD proficiency level, while about 23.41% of respondents considered themselves to be novice. Only 14.45% of respondents considered themselves as advanced, and 3.18% of respondents called themselves an expert. A two-way contingency table (cross tabulation) analysis was conducted to evaluate whether respondents’ proficiency level had any relationship to particular WebCT GOLD tools they used routinely. The two variables were the respondents’ proficiency levels (novice, intermediate, advanced, and expert) and use of WebCT GOLD tools (0, 1). Zero was coded for respondents who did not select that particular WebCT GOLD tool, while 1 was coded for the WebCT GOLD tool name the respondents had selected.

The usage of announcements (Pearson $\chi^2$ (3, N=337) = 17.17, $p = 0.001$), assessments (Pearson $\chi^2$ (3, N=337) = 38.44, $p = 0.00$), e-mail (Pearson $\chi^2$ (3, N=337) = 8.68, $p = 0.034$), discussion (Pearson $\chi^2$ (3, N=337) = 20.01, $p = 0.00$), file manager (Pearson $\chi^2$ (3, N=337) = 23.09, $p = 0.00$), grade book (Pearson $\chi^2$ (3, N=337) = 9.457, $p = 0.024$), group manager (Pearson $\chi^2$ (3, N=337) = 29.25, $p = 0.00$), HTML editor (Pearson $\chi^2$ (3, N=337) = 15.84, $p = 0.001$), learning module (Pearson $\chi^2$ (3, N=337) = 11.39, $p = 0.010$), SCORM (Pearson $\chi^2$ (3, N=336) = 14.25, $p = 0.003$), selective releases (Pearson $\chi^2$ (3, N=337) = 32.11, $p = 0.00$), Web links (Pearson $\chi^2$ (3, N=337) = 10.988, $p = 0.012$), media library (Pearson$\chi^2$(3,
N = 337, χ^2 (3, N = 337) = 9.662, p = 0.022), and calendar (Pearson χ^2 (3, N = 337) = 30.061, p = 0.00) were found to be significantly different between respondents with different proficiency levels. These cross tabulation results confirmed that expert and/or advanced respondents were more likely to use the above listed tools than the respondents who are novices and/or intermediates. Detailed percentages for respondents' use of these tools from each category are given in the figure below.

<table>
<thead>
<tr>
<th>Respondents' routinely used tools</th>
<th>Respondents' Proficiency level</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Announcements</td>
<td></td>
<td>31.6 %</td>
<td>56.3 %</td>
<td>62 %</td>
<td>63.6 %</td>
</tr>
<tr>
<td>Assessments</td>
<td></td>
<td>19 %</td>
<td>31 %</td>
<td>66 %</td>
<td>72.7 %</td>
</tr>
<tr>
<td>E-mail</td>
<td></td>
<td>22.8 %</td>
<td>37.1 %</td>
<td>46 %</td>
<td>45.5 %</td>
</tr>
<tr>
<td>Discussion</td>
<td></td>
<td>26.6 %</td>
<td>43.1 %</td>
<td>62 %</td>
<td>72.7 %</td>
</tr>
<tr>
<td>File manager</td>
<td></td>
<td>34.2 %</td>
<td>56.9 %</td>
<td>72 %</td>
<td>81.8 %</td>
</tr>
<tr>
<td>Grade book</td>
<td></td>
<td>72.2 %</td>
<td>85.5 %</td>
<td>90 %</td>
<td>81.8 %</td>
</tr>
<tr>
<td>Group manager</td>
<td></td>
<td>6.3 %</td>
<td>9.1 %</td>
<td>24 %</td>
<td>54.5 %</td>
</tr>
<tr>
<td>HTML editor</td>
<td></td>
<td>6.3%</td>
<td>10.2%</td>
<td>24%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Learning Module</td>
<td></td>
<td>16.5%</td>
<td>24.4%</td>
<td>36%</td>
<td>54.5%</td>
</tr>
<tr>
<td>SCORM</td>
<td></td>
<td>0.0%</td>
<td>0.5%</td>
<td>0.0%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Selective release</td>
<td></td>
<td>6.3%</td>
<td>24.4%</td>
<td>46%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Web links</td>
<td></td>
<td>24.1%</td>
<td>38.6%</td>
<td>52%</td>
<td>45.5%</td>
</tr>
<tr>
<td>Media library</td>
<td></td>
<td>3.8%</td>
<td>5.6%</td>
<td>6%</td>
<td>27.3%</td>
</tr>
<tr>
<td>Calendar</td>
<td></td>
<td>26.6%</td>
<td>41.1%</td>
<td>66%</td>
<td>90.9%</td>
</tr>
</tbody>
</table>

*Figure 5. Cross tabulation percentages of respondents’ proficiency using different WebCT GOLD tools.*
In addition, a two-way contingency table (cross tabulation) analysis was conducted to evaluate whether respondents’ gender had any relationship to particular WebCT GOLD tools they used routinely. The two variables were respondents’ gender (female, male) and use of WebCT GOLD tool (0, 1). Zero was coded for respondents who did not select that particular WebCT GOLD tool, while 1 was coded for the WebCT GOLD tool name the respondents had selected. With the exception of announcements (Pearson $\chi^2$ (3, N=336) = 6.579, $p = 0.010$) all the other WebCT GOLD tools did not show statistically significant dependence on the user’s gender. Females (58.1%) were more likely to use the announcements tool than males (44).

Furthermore, a two-way contingency table (cross tabulation) analysis was conducted to evaluate whether respondents’ age group had any relationship to particular WebCT GOLD tools they used routinely. The two variables were the respondents’ age group (25 or less, 26 to 35, 36 to 45, 46 to 55, and above 55), and use of WebCT GOLD tool (0, 1). Zero was coded for respondents who did not select that particular WebCT GOLD tool, while 1 was coded for the WebCT GOLD tool name the respondents had selected. In this case, with the exception of file manager (Pearson $\chi^2$ (3, N=336) = 15.752, $p = 0.003$) and learning module (Pearson $\chi^2$ (3, N=336) = 19.754, $p = 0.001$), all the other WebCT GOLD tools did not show statistically significant dependence on the age group of the respondents. File manager shows a trend that as the age increases, the likelihood of using the file manager tool increases, whereas the use of learning module didn’t show such a trend.
<table>
<thead>
<tr>
<th>Respondents’ routinely used tools</th>
<th>Age group in years</th>
<th>25 or less</th>
<th>26 to 35</th>
<th>36 to 45</th>
<th>46 to 55</th>
<th>Above 55</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Manager</td>
<td></td>
<td>29.3%</td>
<td>51.5%</td>
<td>56.5%</td>
<td>63.5%</td>
<td>66%</td>
</tr>
<tr>
<td>Learning module</td>
<td></td>
<td>17.1%</td>
<td>13.1%</td>
<td>26.5%</td>
<td>34.9%</td>
<td>42%</td>
</tr>
</tbody>
</table>

*Figure 6. Cross tabulation percentage of respondents’ age group using different WebCT GOLD tools.*

**Summary**

This chapter described the reliability of the survey administered, followed by the demographical characteristics of the respondents. It also included a section on the relationship between respondents’ routinely used tools with their demographical characteristics. Detailed information about the respondents’ choices about their valuable tool/s was included in this chapter. Last, information about respondents’ reason for increasing, decreasing, or making no change in their use of WebCT GOLD in the fall 2007 semester as compared to the previous semester was also emphasized.

The next section will discuss the implication of the results, discuss the limitations of the study, and provide guidance for potential future research.
CHAPTER 5. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter begins with the summary of the study that includes a recap of the literature review, followed by a brief summary of methodology used and the results. The next sections in this chapter will discuss the results of the survey, show limitations of the study, and provide recommendations for future research.

Summary of Study

In the past half of the century, technology has been playing an ever increasingly important role in our lives and the field of education is by no means an exception. Educational institutions are under pressure to try and test various technological tools to decrease the workload of the instructors while maintaining high standards of education. Learning Management Systems are one such sophisticated Web-based application that has been recently used by numerous institutions. As more and more organizations are involved with the use of some or another LMS, researchers have studied different issues faced LMS users. These studies have shown that even though more and more institutions opt for a LMS, users do not make full use of its capabilities: while a LMS offers many different tools for its users, research shows that only handful of these tools are actually utilized. Also, these studies concluded that a considerable proportion of LMS users had several reservations, such as a lack of technical support, a lack of extra time to learn LMS tools, etc., preventing them from fully adopting a LMS.

To analyze the experiences and views of WebCT GOLD users at ISU, an online survey was conducted as a part of this research. The survey included
questions designed to identify the factors responsible for users’ change in WebCT usage in the semester of fall 2007 as compared to their use in the previous semester. WebCT GOLD offers 20 different tools, and this survey sought information from the ISU users about their favorite tool/tools and the reasons for preferring those tools over others.

Specifically, the survey was designed to gather the following information:

a) Demographic characteristics of WebCT GOLD users at ISU.

b) Factors responsible for WebCT GOLD users’ increased, decreased, or no change in use of WebCT GOLD in the semester of fall 2007.

c) Respondents’ comments on their most valued WebCT GOLD tool/s.

d) Relationships between some of the users’ demographic characteristics and the WebCT GOLD tools used.

This study began in the fall of 2007 with a sample of all the instructors using WebCT GOLD at ISU. To collect the data, an online survey was used over a period of about four weeks. The survey contained both multiple-choice and open-ended questions. Out of total 1,900 invited respondents, 346 respondents complete the survey by the end of the fourth week. It was found that the typical respondent was a female faculty member between the age group of 25 to 36 years who teaches undergraduates in the College of Liberal Arts and Sciences.

The results for the factors responsible for increasing, decreasing, or not changing WebCT GOLD use suggest that 40% of the respondents increased their WebCT GOLD usage, 16% decreased their usage, while 38% commented that they have not changed their usage level. A few of the major reasons given by the
respondents who increased their WebCT GOLD usage were increased course load, use of additional WebCT GOLD tools, encouragement by the technical support offered by ISU, familiarity due to experience, and student demand. The respondents who decreased the usage level also gave various supporting reasons, including decreased course load, lack of time, hardware difficulties, lack of support, lack of flexibility of WebCT GOLD, WebCT GOLD’s non-intuitive interface, and better alternative options (Wiki, private Web pages). The respondents who had not changed their usage level offered reasons such as a same course load over the two semesters, difficulty of use, lack of time required to learn new tools, etc.

The respondents overwhelming chose to use convenient tools designed to reduce work load and increase productivity, such as the grade book, file manager, announcements, and assessments features. The discussion tool designed to induce communicative learning also received favorable remarks. On the other hand, the chat, SCORM, and Roaster tools did not receive favorable remarks.

As for relationships between WebCT GOLD tools used by the respondents and their gender, at ISU the utilization of all the WebCT GOLD tools, except for the announcement tool, showed no significant difference between the genders. Also, when looking at the relationship between the tools used and the job position, it was found that only assessments, file manager, and learning module tools showed a significant relationship with the respondents’ position, indicating that all the other tools are likely to be used to an equal extent by all the respondents regardless of what position they hold at ISU. One more interesting relationship between the respondents experience and the tools they used was observed: the use of
interactive tools such as discussion, e-mail, and hard to use tools like the HTML editor increased with the increased experience of the respondents. On other hand, user friendly tools such as the grade book were used by all the respondents to an almost equal extent regardless of their prior experience.

**Discussion of Results**

The results are discussed in this chapter according to the following categories.

**Demographic characteristics**

In order to obtain statistically significant data, it was essential to attract as many responses as possible for this study, so the potential respondents in this study included all ISU faculty members, teaching assistants, academic support staff, and other administrative staff who used WebCT. The survey was made accessible to all these potential respondents via WebCT GOLD, and the respondents were urged to participate in the survey via e-mail.

Out of all the potential 1,900 participants, 346 individuals responded to the survey. Out of 346 respondents, 55% (189 participants) were female, while 43% (150 participants) were male.

The majority of the respondents were faculty members (56%), while 21% were teaching assistants. One of the interesting outcomes of this data was the teaching levels reported by the respondents: 82% of the respondents indicated that they taught undergraduate courses as compared to only 36% who indicated that
they taught at the graduate level. Since undergraduate courses have a much larger number of students per class than graduate courses, it seems that instructors are finding WebCT GOLD more valuable for use in undergraduate courses, although a conclusive statement about this connection cannot be made since the difference in the percentages might merely be a reflection of the overall higher number of undergraduate courses compared to graduate courses taught in the university. More research would be required to make any conclusive statement regarding the relationship about level of course and LMS use.

The demographic data indicates that the majority of respondents work in the College of the Liberal Arts and Sciences, while the College of Business, College of Design, Graduate College, and College of Veterinary Medicine were represented by much fewer participants. Assuming an approximately equal percentage (of respondents from each college) of the WebCT GOLD users responded to the survey, it seems that WebCT GOLD is used by the highest proportion of teaching staff in the College of Liberal Arts and Sciences. It needs to be noted that the least number of respondents indicated that they teach in the Graduate College (3%), again suggesting that teaching staff at the graduate level are least likely to use WebCT GOLD. Respondents representing the Colleges of Design, Veterinary Medicine, and Business reported slightly higher use of WebCT than the respondents from the Graduate College, but nowhere near as high as reported by teaching staff in the College of Liberal Arts and Sciences.

In the survey, respondents were asked to indicate their age group. Assuming that an approximately equal percentage of the WebCT GOLD users across age
ranges responded to the survey, the majority of the WebCT GOLD users were in the age group of 26 to 35 years (29%), while the second most populous group was in the age range of 36 to 45 years (24%). The data suggests that the use of WebCT GOLD decreases with the increasing age of the respondents. Similarly, Adams (2003) reported that faculty members who integrate technology into their teaching are more likely to be younger, while another study conducted by Schifter (2002) found no statistically significant difference for the faculty age range. This study at ISU supports Adams’ conclusion, although one should consider this result with reservation, as one has to assume that an equal proportion from all the age groups responded to the survey.

Various factors influence or encourage teaching staff to use a LMS in their classes, such as students’ requests, recommendation by co-workers, university policy, etc. To study these factors at Iowa State University, a question about motivating factors was included in this survey. It was interesting to see that only 10% of the respondents said that they started using WebCT GOLD because their students requested it. On other hand, 68% of the respondents indicated that they started using WebCT GOLD because the university supports LMS use. Later, in the open-ended question portion of the survey, various respondents expressed reservations about such policies encouraging WebCT GOLD use. For example, one of the respondents commented, “… I cannot believe that the university is paying for this system and fostering it on the teaching staff…” This study suggests that at least a small percentage of the WebCT GOLD users are uncomfortable using WebCT GOLD, but still use it due to university policy and lack of an alternative.
These were some of the interesting findings observed from the demographic data. Unfortunately, since only 19% of the WebCT GOLD users responded to the survey, further research with better participation is warranted to clarify some of the tentative outcomes.

**Factors responsible for WebCT GOLD users’ increased, decreased, or no change in WebCT GOLD usage in fall 2007**

One of the important goals of this research was to determine whether WebCT GOLD usage was increased or decreased at Iowa State University during the fall 2007 semester as compared to the previous semester. An open-ended question was included in the survey requesting that the respondents comment about the reasons for changing their WebCT GOLD usage. Various interesting comments were received, and the data showed that 40% of the respondents had increased their usage as compared to the previous semester, 16% decreased their usage, while 38% reported that their usage remained the same. Even though 40% of respondents had increased their WebCT GOLD usage, it needs to be noted that the majority of the respondents reported that fall 2007 was the first semester they used WebCT GOLD.

According to some of the earlier studies, a lack of technical support was identified as a major factor that discourages technology users from using various technologies. Morote (2004) found that a technical support network can be a major motivation for users to use various technologies, while users’ initial negative experience due to the lack of technical support can grow into general reluctance to
use to learn other technologies. Moreover, Young (2004) found that faculty may use technology poorly due to a lack of technical support, making students frustrated and negating the whole point of introducing technology in the field of education.

The results of this study also support the above conclusions. The comments made by some of the respondents suggest that the technical support provided by the university is invaluable and because of the support respondents are more comfortable using WebCT GOLD. For instance, one of the comments said, “I have great support from our college staff.” From the responses, it was also observed that the workshops organized by the university’s technical support team are also very helpful and encouraging to the WebCT GOLD users.

Morgan (2003) reported that faculty members start with using LMS certain tools and, once their comfort level grew with experience, they start to include new tools in educational practice. The results from this survey were in agreement with Morgan’s findings. Various respondents commented that their usage increased due to the introduction of new WebCT GOLD tools in their educational practice, and they attributed this increase to experience with using WebCT GOLD. One of the respondents commented, “better proficiency with different parts of WebCT has led me to use it more than I did it previously,” while another respondent said, “more experiences open up more possibilities.”

One of the important issues raised by this study was the lack of an alternative to the WebCT GOLD at Iowa State University. Some of the respondents claimed that their usage of WebCT increased, despite having some reservations about the system, because of the lack of an alternative LMS. Such comments were also made
by the respondents who decreased their usage of WebCT GOLD. Respondents who had reservations about WebCT GOLD suggested various other alternatives such as Wiki, an LMS system designed by Illinois University, Blackboard, or even the older version of WebCT. As an example, one respondent commented, “GOLD version is much worse than Cardinal version. Some of the easy to do tasks have become impossible or very difficult," while another respondent said, “I was much more familiar with Cardinal and find it more intuitive to use.” From the comments received in this study, it seems that not all the faculty members are happy with WebCT GOLD. But at the same time, it is very encouraging to note that at least some of them are trying different tools such as Wiki, private Web pages, etc.

The overall percentage of the respondents who decreased their WebCT GOLD usage was 16%. The comments made by these respondents were very elaborate and articulate. One of the major factors discouraging their use WebCT GOLD seems to be the technical problems faced by the respondents and their students and the lack of time to learn new tools. Massy (2004) and Young (2004) reported that most instructors want to learn to use educational technology effectively but they lack the time, access, and support necessary to do so. While very few respondents at ISU indicated a lack of technical support, many of them mentioned a lack of time to learn new tools. WebCT GOLD offers 20 different tools for effective educational practice, and I believe that it is essential for the users to make full utilization of these tools in order to make education effective and efficient. More research is warranted to determine the exact solution for respondents' apathy towards certain LMS tools.
As stated earlier, many of the respondents who decreased their WebCT GOLD usage attributed their decrease to the various difficulties while operating WebCT GOLD, such as the slow response time of the software and general non-intuitiveness of the software, etc. It seems that additional workshops specifically designed to address the technical problems faced by respondents would be one solution. It should also be noted that WebCT GOLD may have its own inherent drawbacks, so improvement in the software could be another strategy for increasing users’ satisfaction level. For example, WebCT GOLD is not compatible with early version of the Java platforms, which creates annoying error messages for users. Entering equations in the grade book is also a very tedious task, making the task difficult for users. Such software glitches can be eliminated by improving the software itself.

This study indicated that 36% of the respondents did not change their WebCT GOLD usage level. Even though many of these respondents commented that their usage has remained the same due to the same course load, it needs to be noted that these respondents had not started using any new LMS tools. In order to utilize WebCT GOLD to its full potential, it is essential to encourage and support all users to increase their software utilization level. This increase can be achieved by offering more help sessions to explain advantages of all the tools offered by WebCT GOLD. For instance, one of the respondents commented, “I am aware that I use only limited tools of WebCT, but my perception is that the learning curve is too steep for it to be worth my while to attempt more complicated function. I would be interested in doing that if it was easy to set up.” Such comments point to the fact that in order to make
WebCT GOLD universally acceptable it needs to become as user friendly and intuitive as possible, because, while faculty members are experts in their own educational fields, they may not be technologically well versed. Developing a system where an instructor can seek immediate help would be beneficial. For example, if the WebCT GOLD designers install a hot line or an online chat help session, available to any instructor to answer immediate concerns would be whole heartedly welcomed by the instructors.

Morgan (2003) reported various reasons that discouraged faculty members from using LMSs, including time requirements, student use problems, reliability concerns, etc. The results from this study are in agreement with Morgan’s findings. One of the respondents specifically commented about the reliability issue of WebCT GOLD: “My students are really ticked off about not being able to upload their assignments from their home computers, and I am really ticked off about having to accept late assignments because I can’t be sure that it wasn’t a technical difficulty.” Such reliability issues can sow seeds of doubt in the minds of the user and persuade them to avoid using LMSs and educational technology in general.

In sum, just below half of the respondents increased their WebCT GOLD usage, while the rest maintained or decreased their use.

**Respondents’ comments on their most valuable WebCT GOLD tool/s**

WebCT GOLD has 20 different tools that are designed to create an effective and efficient learning experience for students. One consistently mentioned essential ingredient for student learning is the degree of engagement between the student and
the material to be mastered (Johnstone, 2002). Along those lines, Ansorge and Cooley, (2003) asserted that “Web-based instruction provides students with instantaneous access to current content and gives instructors more time to interact with students by freeing them from mundane repetitive tasks such as transmitting content to students.” There are various such studies that suggest that effective learning can be achieved by promoting technology that encourages or facilitates communication among students as well as between students and the instructor. Accordingly, WebCT GOLD has various tools that are designed either to reduce mundane tasks of the instructors to give them more time to interact with the students or the tools that can facilitate effective communication among the students themselves and with the instructor (Morss, 2006). Even though various LMS software are available with various different tools, previous studies have reported that only a few of these tools are routinely used by the users. For instance, Yohon et al. (2004), in their study conducted at Colorado State University, reported that WebCT’s Web site publishing tools (such as content page, syllabus, and presentation distribution) are most used, while the interactive tools (such as chat, group presentations, and threaded discussion) were seldom used. In other words, WebCT was used just as a convenient tool to increase productivity rather than a tool to increase students’ opportunity for higher order learning. However, according to Sandholtz, Ring Staff, and Dwyer (1994) the real benefit of technology as an instructional tool is “a medium for thinking collaborating, composing, and communicating.” Thus, it is essential to determine whether faculty members are using WebCT GOLD tools to the full potential or not. If not, one needs to analyze
which tools are being used the most and the reasons behind their use. This was one of the goals of the study conducted at ISU.

In this survey, the respondents were asked to comment on the WebCT GOLD tool that they found most valuable. In agreement with earlier studies, the majority of the respondents found “convenient tools” such as grade book, file manager, announcement, etc. as the tools that most helped reduce the work load of the instructor and increase their productivity. One of the major benefits mentioned by the instructors about the grade book was that students are able to know their exact grade status all the time. One of the respondents commented, “it helps communication tremendously as students can check WebCT GOLD and know exactly where they stand grade wise throughout the semester.” One more major benefit noted by the respondents is the elimination of discrepancies regarding the grades of the students. Since the students can actually access the grade book and monitor their grades, the chance of any mistakes in grades is greatly reduced. Respondents also mentioned that the grade book tool is an effective way of keeping all the grades organized and stored on a reliable accessible server.

Along with the grade book, the other convenient tool praised by the respondents was the file manager. This tool offers a reliable location on a common server to store all the course related files, such as PowerPoint presentations, lecture notes, etc. The presence of such a storage location eliminates the chances of losing the information due to a hard disk crash. It also makes all the information accessible at any time to all the students, eliminating students’ frequent requests for the lecture
notes. These advantages offered by the file manager were mentioned by the respondents in justifying their preference for this tool.

The assignments tool also received favorable remarks from the respondents, who commented that it saved time during face-to-face meetings since students submit all their assignments online and not in class. At the same time, it is worth noting that some of the respondents have also made comments suggesting that the assignment tool is not always a well received tool: “My students are angry since they cannot submit their assignments on time as they cannot access WebCT from home, and I am angry because I have to accept late assignment since I don’t know the real reason.”

The assessments tool was also among the respondents’ favorite tools. This tool offers the option to conduct online tests and quizzes. Since these quizzes are automatically graded, this tool is well received by the instructors teaching large classes. Just as Glenda Morgan mentioned in her study, ISU respondents favor the assessments tool since it saves a lot of paper, reducing costs and helping our environment.

The only tool that helps promote interaction among the students that received favorite remarks was the discussion tool. The discussion tool offers a platform where students can discuss course related questions either posted by the students themselves or by the instructors. One of the respondents mentioned that students tend to be more open with the instructors in the WebCT discussion area since students can post their questions anonymously, which is a very important point. Due to peer pressure, students may become hesitant in raising their hands and asking
questions during face-to-face meetings. For those students, the discussion tool offers an ideal platform for them to get their queries solved. The discussion tool also offers an opportunity for instructors to increase interaction with students outside the class, offering the students additional time to complete their course work. Instructors can also judge the extent to which the students have grasped the concepts taught in the class by analyzing the discussion sessions. An earlier study conducted by Yohon et.al. (2004) concluded that their set of respondents did not receive the discussion tool well. It is encouraging to see that at ISU instructors are using this tool frequently.

Even though the majority of the tools mentioned as valuable by the instructors are convenience tools that reduce the teaching work load, one must not forget that these tools do offer additional time for the instructors to make teaching more effective. This study suggests that more technical support or help sessions that can introduce the instructors to the advantages of using interactive tools, such as chat, are warranted to help increase WebCT GOLD users’ participating in those tools.

Relationships between the WebCT GOLD tools used by the respondents to their demographical characteristics

Previous studies have suggested that even though LMSs offer various tools, few of these tools are actually routinely used by faculty members. Indeed, WebCT GOLD offers 20 tools: announcements, assessments, assignments, chat/white board, e-mail, discussion, file manager, grade book, group manager, HTML editor, learning module, SCORM module, selective release, grading forms, student learning, Web links, Roaster, media library, goals, and calendar.
Each of these tools has a specific function and is designed to support effective teaching. To gain information about which of these tools are actually routinely used by the respondents, the survey included a question aimed to gather that data. The responses showed that the grade book (81%), file manager (53%), announcements (50%), assignments (48%), discussions (42%) and calendar (42%), assessments (33%), and e-mail (31%) were the most commonly used tools among the respondents at ISU. To determine the relationship between the routinely used tools and various demographical characteristics of the respondents, cross tabulation was performed. The selected demographical characteristics were respondents’ position, their prior experience of using any LMS, their proficiency level, their gender, and their age group.

The results showed that support staff members were more likely to use assessments than the faculty members and teaching assistants, while the file manager tool was used more frequently by the faculty members. File manager offers a convenient server location to store all the course related files, such as PowerPoint presentations, lecture notes, old tests, etc. Since faculty members use all these resources for teaching, as compared to teaching assistants and academic support staff, the result seems consistent. No other tools showed any significant relationship with the respondents’ position, indicating that all the other tools are likely to be used to an equal extent by all the respondents regardless of what position they hold at ISU.

Various researchers have discussed the relationships between the experience the user has using technology and the degree of adoption of technology
in their field. In general, more experience leads to more as well as better use of technology in education. For instance, Wingard (2004) stated, “the longer faculty work with the Web, the more likely they are to pursue and derive pedagogical benefits from the technology” (p. 11). Similarly, a review of the literature conducted by Dillon and Walash (1992) indicated that faculty involved in distance education endeavors gain more positive attitudes about technology as their experience increases. To determine the relationship between the respondents’ prior experience using a LMS with their routinely used WebCT GOLD tools, a cross tabulation test was conducted. It was not surprising to note that use of interactive tools, such as discussion and e-mail and hard to use tools like the HTML editor, increased with the increased experience of the respondents. On other hand, user friendly tools such as the grade book were used by all the respondents to an almost equal extent regardless of their prior experience.

Furthermore, previous studies have suggested that effective use of technology depends on the proficiency level of the users. Alanis (2004) stated that “faculty unfamiliar with the technologies they are using are likely to depend on dimensionless transfer of traditional materials to the new technological medium, because they don’t grasp what powerful tools are available to them” (p. 21). In addition, Frey (2004) stated, “whether for administrative or pedagogical purposes, creating online materials is a cumulative process that develops with experience” (p. 2). In this study conducted at ISU, some of the comments were consistent with the earlier studies. For example, one comment said, “increased experience opens new avenues.”
The survey included questions to test whether proficiency level of the respondents affects their efficiency in using various tools of WebCT GOLD. The cross tabulation test revealed interesting results that were consistent with the previous studies: in most of the WebCT GOLD tools, participation increased with increasing proficiency level. Most importantly, the tools that were not routinely used by the respondents at ISU, such as group manager, HTML editor, selective release, and Web links, were most often used by respondents that considered themselves either advanced or expert WebCT GOLD users.

Much research has analyzed gender bias in the use of technology. For example, Adams (2003) reported that faculty members who integrate technology into their teaching are more likely females. On other hand, Schifter (2002) found no statistically significant differences for faculty gender in distance education participation, and Yohon (2004) also concluded that there were no significant differences between WebCT adopters and non-adopters on teaching research service and time distribution by gender. To determine whether the use of certain WebCT GOLD tools at ISU were preferred by any particular gender, probing questions were included in the survey. After analyzing the data statistically, it was concluded that at ISU the utilization of all the WebCT GOLD tools, except for the announcement and student learning tools, had no significant difference between the genders.

**Recommendations**

This research analyzed the WebCT GOLD users at ISU in detail. The views and perspective of the instructors using WebCT GOLD were quantitatively as well as
qualitatively analyzed and discussed. Instructors, administrators and researchers can use this study as guide for further investigation into adoption of LMS in higher education.

**For instructors**

- Instructors need to keep themselves updated with the latest technology by attending training sessions at regular intervals.
- Instructors need to communicate with the support staff in order to help them design training sessions addressing any specific concerns or suggestions.

**For WebCT designers**

- The survey suggests that LMS users face various problems and would like to get their concerns solved with immediate and personal attention. For LMSs users it would be very beneficial if the WebCT designers install a system such as hotline or online help session were users can get 24/7 support.
- According to the respondents WebCT is not compatible with the latest Java functions. WebCT designers need to immediately solve since various web applications run on Java platforms. Since latest Java versions are not supported by WebCT, the LMS users face lot of difficulties especially because many of them are unable to understand the problem.
Various respondents suggested that WebCT pages are loaded on individual machines at a very slow pace. WebCT designers/ university WebCT support personnel need to look into this matter in order to increase the response rate of WebCT either by changing software based modifications or increasing server space.

**For administrators**

Faculty want and expect support that would help them increase their WebCT GOLD usage. Therefore the WebCT GOLD administrators should:

- design technical support sessions or help sessions targeting instructors with variable technical aptitude.
- provide technical support sessions explaining the importance of various tools and the role played by the tools in educational pedagogy.

**For researchers**

- This survey could serve as a pilot instrument for future research at ISU.
- Future researchers may include the views of the instructors who do not use WebCT GOLD at all. By knowing their views and their reasons behind non-adoption of WebCT GOLD, one can gain important information about modifications that need to be made in the LMS to attract non-adopters.
- Future researchers may survey the instructors who have stopped using WebCT GOLD for various purposes. Their views or the reasons behind
abandoning the LMS would be valuable to make necessary changes in the LMS to make it more widely acceptable.

- This survey was given only to the instructors and the support staff. In order to make effective utilization of WebCT GOLD, one also needs to consider the views and the suggestions from the students who use the LMS. Their perspectives and suggestions can be helpful in designing better help sessions for instructors.

**Summary**

The following section concludes all the major outcomes of this research.

The ISU WebCT GOLD users who participated in this study

- were typically a female faculty member, between 25 and 36 years old, teaching undergraduates in the College of Liberal Arts and Sciences.
- mainly used WebCT GOLD because it is supported by ISU.
- increased WebCT GOLD usage because
  - they had an increased course load for the fall 2007 semester
  - increased experience made them comfortable enough to use additional tools
  - they found the technical support provided by the university valuable
  - WebCT GOLD was found to be very useful for supporting distance education
- decreased WebCT GOLD usage because
they had a decreased course load in the fall 2007 semester
they found WebCT GOLD unacceptably slow
they were disheartened by the non-intuitive interface of WebCT GOLD
they found other interactive software more effective and useful than WebCT GOLD

- did not change their WebCT GOLD usage because
  - they had same course load for the fall 2007 semester as compared to the previous one
  - they encountered some unpleasant experiences in using WebCT GOLD in an earlier semester
  - they found WebCT GOLD had a slow response rate
  - the time investment to learn new tools was not possible
  - certain tools were deemed hard to use without a substantial time investment

- found the grade book tool the most valuable followed by file manager, announcements, assignments, and discussion.

To conclude, this survey offers very promising strategies that can be utilized to make the fullest use of WebCT GOLD and achieve effective and efficient pedagogical experience for both students and instructors.
1. Currently, my primary position is:

- [ ] a. Faculty
- [ ] b. Teaching assistant
- [ ] c. Academic support staff
- [ ] d. Other

2. Currently I teach:
   (Select all that apply)

- [ ] a. Undergraduate
- [ ] b. Graduate
- [ ] c. Certificate program
- [ ] d. Non degree program
- [ ] e. Workshop and Continuing Education

3. My major appointment is in:

- [ ] a. Agriculture and Life Sciences
- [ ] b. Business
- [ ] c. Design
- [ ] d. Engineering
- [ ] e. Graduate
- [ ] f. Human Science
- [ ] g. Liberal Arts and Sciences
- [ ] h. Veterinary Medicine

4. My gender is:
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<td>b. Male</td>
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5. My age group is:

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<th>a. 25 or less</th>
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<td>b. 26 to 35</td>
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<td>c. 36 to 45</td>
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<td></td>
<td>d. 46 to 55</td>
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<td></td>
<td>e. Above 55</td>
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6. Currently, I use WebCT GOLD for:
   (Select that apply)

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<tr>
<th></th>
<th>a. Supplementing face to face courses</th>
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<tbody>
<tr>
<td></td>
<td>b. Online/ Distance courses</td>
</tr>
<tr>
<td></td>
<td>c. Other</td>
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7. The Learning Management System / Course Management System that I have used before is/are:
   (Select all that apply)

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<tr>
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<th>a. WebCT Cardinal/ older versions of WebCT</th>
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<td></td>
<td>b. Desire2Learn</td>
</tr>
<tr>
<td></td>
<td>c. Angel</td>
</tr>
<tr>
<td></td>
<td>d. Moodle</td>
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<tr>
<td></td>
<td>e. eCollege</td>
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<td></td>
<td>f. Blackboard</td>
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<td>g. Other</td>
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8. Prior to this semester, my experience with using any Learning Management System/ Course Management System is:
a. Less than 1 year
b. 1-3 years
c. 4-6 years
d. More than 6 years

9. I use WebCT GOLD in my teaching because:
   (Select all that apply)
   a. The university supports it.
   b. Other faculty members recommended it.
   c. The students requested it.
   d. It was my independent decision.

10. I would best describe my proficiency level for using WebCT GOLD as:
   a. Novice
   b. Intermediate
   c. Advanced
   d. Expert

11. I would best describe my usage of WebCT GOLD as:
   a. Occasionally
   b. A few times a week
   c. Daily

12. The browser I use most often to access the Internet is/are:
    (Select all that apply)
    a. Internet Explorer
    b. Firefox
13. The WebCT GOLD tools I use/d routinely are:  
   (Select all that apply)

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14. Which WebCT GOLD tool/s do you find the most valuable in your teaching?  
   Why?
15. Please rate how difficult or easy you find each of the following WebCT GOLD tools.

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- a) Very Easy  
- b) Easy  
- c) Average  
- d) Difficult  
- e) Very Difficult  
- f) I did not use this to

16. Please respond to the following statements that describe the encouragement factors of your use of WebCT GOLD.

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<td>I can finish my course related tasks more efficiently when I use WebCT GOLD.</td>
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<td>b.</td>
<td>The training sessions/workshops I attended at Iowa State University</td>
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increased my use of WebCT GOLD

c. WebCT GOLD saves me time while completing course related tasks

d. The easy accessibility to the support staff at Iowa State University encourages me to use WebCT GOLD more often.

e. The use of WebCT GOLD promotes my students’ communication with me.

a) Strongly agree b) Agree c) Disagree d) Strongly Disagree e) Not applicable

17. Please respond to the following statements that describe the discouragement factors of your use of WebCT GOLD.

a. While using WebCT GOLD, I face many hardware and software problems.

b. I work too hard to build my course in WebCT GOLD.

c. The average response time of WebCT GOLD during the last semester was slow. (i.e. the speed at which the pages load etc)

d. My students find WebCT GOLD difficult to use.

e. I feel the students with better knowledge of computers get an unfair advantage using WebCT GOLD.

a) Strongly agree b) Agree c) Disagree d) Strongly Disagree e) Not applicable

18. My use of WebCT GOLD this fall semester as compared to previous Spring semester has:

a. Increased

b. Decreased

c. Remained the same

19. Please provide reason/s for your answer to the above question.

20. I will continue the use of WebCT GOLD for my future classes.
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<th>a. Strongly disagree</th>
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21. Please feel free to share any other comments you might have regarding the use of WebCT GOLD in your class/es.
REFERENCES


http://chronicle.com/weekly/v51/i12/12a03101.htm