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Electronic Discussions and Achievement in a Conventional College Classroom

by

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ABSTRACT

This study explored electronic discussion use in the conventional classroom as related to student achievement. Study participants were two intact groups of students (N = 30), taking college diploma programs in conventional classrooms. Findings of this study will be of interest to college instructors and professional development departments.

This quasi-experimental research used a pre-test/post-test design. Students were pre-tested at term mid-point and then post-tested at term-end. In addition, two surveys were administered, one at the study beginning and the other at the end. Mean differences of post-test scores were compared based on whether students participated in electronic discussions or not. Although there was some change, ANCOVA analysis showed no significant difference of means between the groups on post-test scores. Survey data indicated that students who participated in electronic discussions used them to answer course questions in a timely manner. In addition, survey results suggested student-to-student interaction was enhanced.

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CHAPTER I: INTRODUCTION

Background

Face-to-face discussion is a fundamental instructional technique for teaching and learning, observable in many college classrooms. Small and large group discussions assist students to reflect on and develop their ideas as well as check their understanding of course material. For the instructor, discussion provides timely feedback on student understanding of course material and builds classroom community. Yager, Johnson, and Johnson (1985) found verbal discussions promote mastery, as well as understanding and retention of material being learned.

Discussions are an important component of the development of critical thinking and collaborative learning skills. Classroom environments that encourage critical thinking are described as interactive and discussion oriented (Meyers, 1986). Larson & Keiper (2002) state that discussions contribute to the development of higher order thinking skills, like Bloom's (1956) taxonomy levels of analysis and synthesis. In addition, discussions provide immediate feedback, and have a high correlation with student achievement.

Online distance learning students use Internet tools such as electronic mail (e-mail), discussion boards and web chat to simulate face-to-face discussions. In both face-to-face and electronic discussions, a variety of participants interact together in dialogue: students, instructors, and guest speakers.

There are several commonly used Internet tools in education: chat, electronic mail, and discussion boards (computer conferencing). All three are text based tools that permit participants around the world to converse with one another. Chat provides synchronous communication, requiring participants to be logged into the tool at the same time. Electronic mail and discussion boards are both asynchronous forms of electronic communication, and therefore support a time lapse between postings. The course website platform used in this study, WebCT, offers all three of these Internet tools.

Chat may not provide a text record of the conversation, and occurs in real-time. Many-to-many communication is common; however, participants often shorten their writing so they can keep up with the dialogue. Electronic mail is well suited for one-to-one and one-to several communication. Typically, listservs use electronic mail to communicate with a large group. Individuals e-mail to the list address and their communication is directed to all list members. Both rely on participants to retain text that communicates context, and therefore messages become disorganized when trying to communicate over prolonged periods of time.

An electronic discussion board (computer conferencing) uses a communal database for the posting of messages from participants. Separate topic areas can be created. In addition, each message is automatically numbered and a subject and the author name are added to each message. Participants are able to sort the messages by subject or date as well as search for author names and keywords.

This provides threads (context) within the discussions that assist readers in following specific context and ideas.

Each of these tools appear to simulate some aspect of the classroom discussion experience, however, electronic discussions have become the more popular tool for online distance students.

Asynchronous communication has some advantages over face-to-face discussions, including more opportunity for all to participate and the freedom to respond within flexible timelines. Asynchronous communication can increase the comfort level for the "shy student" thereby increasing the likelihood that they will participate in class discussion. As well, this mode of communication accommodates those participants who may need more time to reflect upon and formulate their ideas (Larson & Keiper, 2002).

The use of electronic discussions in conventional classrooms is not common, but it may certainly have some advantages. Classroom environments that encourage critical thinking are described as interactive and discussion oriented (Meyers, 1986). Connolly and Smith (2002) examined conventional classroom discussions and found that some students were either anxious or fearful in large group discussions. Student anxiety decreased when the instructor participated in the discussion as a member of the group, instead of the role of the teacher, and this contributed to increased group dialogue. Also, discussions in conventional classrooms are limited by structured time periods, whereas asynchronous communication offers flexibility to extend time periods for dialogue.

New faculty members, at the institution where this research was conducted, are required to attend a general orientation to the college. Standard orientation material about instructional techniques is provided and instructors have the additional option of attending an Instructional Skills Workshops (ISW).

ISW workshops are used by many post-secondary institutions in Canada and the United States to help instructors identify and practice effective teaching skills. The ISW handbook and workshop model was developed by the British Columbia Ministry of Advanced Education, Centre for Curriculum, Transfer & Technology (C2T2) in 1982 and has been adopted by the Faculty Development Office at the institute where this research was conducted.

The ISW Handbook lists several types of discussions that instructors may consider using as instructional techniques: buzz groups, debate, group discussion, and panel discussions. (Centre for Curriculum, Transfer & Technology , pp. 85-89). Electronic discussions are not on this list of potential instructional techniques for the conventional classroom.

Colleges provide face-to-face students with access to computers in a variety of ways: laptop programs in wireless classrooms, scheduled computer labs and access to open lab computers on-site. Course websites are becoming more common. Electronic discussions are an instructional technique that these instructors may not currently consider.

Students and instructors in conventional classrooms may indeed benefit from the use of electronic discussions being implemented as a complement to conventional face-to-face communication. Electronic discussions should be

considered as an integral instructional tool for the traditional classroom student (Hammond, 1999).

Purpose of the Study

The purpose of this study is to determine if electronic discussion use by conventional classroom college students is related to achievement. Additionally, the student perspective on their electronic discussion experience was of interest.

This research will be of interest to college instructors, college professional development departments and instructional technology departments.

Problem Statement

The main problem in this research was to determine if a relationship exists between student participation in electronic discussion and student achievement in a conventional college classroom. Within this question, there were several other related areas to explore, such as gender and program differences.

Research Hypothesis

The hypothesis of this study concerns student participation in electronic discussions and whether it is related to student academic achievement. The hypothesis statement follows.

Students who participate in electronic discussions will attain significantly higher grades than students who do not participate in electronic discussions.

In addition to the above hypothesis, the following questions were explored.

- Is there a difference in message length and message frequency between programs?
- Is there a difference in message length and message frequency between males and females?

Limitations

The first limitation of this study was the sample size. There were 30 students in total that participated, out of an anticipated 60. To ensure privacy for the students involved, and as the researcher was the instructor, consent forms were not reviewed until the study had been completed and course grades had been submitted.

The second limitation was the nature of the sample. These were intact groups, and therefore not randomly assigned or selected. The researcher had no practical way of determining if the group's history and academic achievement prior to entering the programs were equivalent. In an attempt to minimize this limitation, a survey was administered during the pre-test phase. The survey asked students to identify their past experience with discussion boards and chat rooms.

A third limitation was that each group of students took two different courses and had an opportunity to participate twice, once in each course. A student who consented to participate in both courses was only counted once.

Definitions of Terms

Electronic Discussions (Computer Conferencing or e-discussions): Text messages posted to a discussion board by a student, instructor or guest. Messages are semi-permanent and can be sorted by thread (subject) or date.

Microsoft Excel™ (MS Excel): A commonly used spreadsheet computer program used for numeric calculations, statistical analysis and chart creation.

Microsoft Word™ (MS Word): A commonly used word processing computer program used for the typing and formatting of documents such as letters and reports.

SPSS™: An abbreviation for Statistical Package for the Social Sciences. SPSS is a commonly used computer program for advanced statistical analysis and reporting.

Student Achievement: Final exam marks will be used as the measure of student achievement. All marks will be reported as a percentage.

Student Participation: Student participation will be identified from WebCT discussion logs. At least 1 message posting will be considered as participation in WebCT discussions.

WebCT™: An abbreviation for (World Wide) Web Course Tools. WebCT is an electronic learning system that enables instructors to create course websites. Each website contains a variety of web tools such as course contents, quizzes, web chat, and discussions.

Organization of this Thesis

This thesis contains five chapters. Chapter I has provided an introduction to the problem, including the hypothesis to be tested. Chapter II will present a review of related literature. Chapter III will discuss the research methods and Chapter IV the results. Chapter V concludes this thesis with the research summary, and recommendations for further or, related research.

CHAPTER II: LITERATURE REVIEW

Introduction

The body of literature about electronic discussions for post-secondary students is primarily focused on distance education students. Electronic discussions research has several areas of concentration: critical thinking, constructivism, and online communities. There is limited information concerning the use of online discussions in conventional classrooms or as it relates to student motivation and achievement.

Critical Thinking

"Critical thinking is deciding rationally what to or what not to believe" (Norris, 1985). The asynchronous and democratic nature of discussion boards produces a useful hybrid of writing exercises and in-class discussions that fosters reflection on both cognitive and social aspects of interaction. They allow for feedback and reflection from a variety of perspectives: self, peers, and instructors. The discussion stream tends to be disjointed, like a first-draft, but provides much more exposure to facts and opinions than would be possible in a face-to-face discussion. The somewhat messy process is where critical thinking occurs. (Greenlaw & DeLoach, 2003; Haughey, 2002; Newman, Johnson, Webb, and Cochrane, 1997)

Course instructional design and instructor facilitation have an impact on the level of critical thinking achieved through the use of electronic discussions.

Knowlton (2001) reviews the use of electronic discussions in the pursuit of durable learning, a term closely related to critical thinking. Durable learning refers to the higher order thinking skills in Bloom's taxonomy of the cognitive domain: application, analysis, synthesis and evaluation (Bloom, 1956). Knowlton's research suggests criteria and instructional design considerations for instructors using electronic discussions with their students. Some of these guidelines include: (a) explaining the purpose of the online discussion to students, (b) creating a sense of community among participants, (c) including evaluation of student's postings in design considerations, and (d) synthesizing students' contributions to create a comprehensive view of the discussion.

Constructivism and Social Construction

Much of the research about electronic discussions is within the field of constructivism and social construction, a phenomenological approach to learning and socialization. In education, constructivism is the view that learners construct their own knowledge rather than receiving it from others. Social construction is an extension of this view, where a person's reality is believed to be constructed by his or her own interpretations and knowledge of reality.

Prior to electronic discussions, distance education courses were independent pursuits for students, or at best provided phone or written opportunities for student-instructor interaction. There was little or no opportunity for social construction within the distance learning community. Internet communication tools appear to provide a level of communication between students in distance courses that was not possible in the past.

Online environments are characterized by the absence of non-verbal communication that occurs naturally in face-to-face settings. Some researchers have explored the computer conferencing environment in depth to determine its characteristics. A framework developed by Anderson, Rourke, Garrison, and, Archer (2001) uses a model of community of inquiry and suggests four components of teaching and learning for a text-based environment. The four elements of this framework are: (1) cognitive presence, (2) social presence, (3) teaching presence and (4) methodology. Social presence is "the ability of learners to project their personal characteristics into the community of inquiry, thereby presenting themselves as real people." Their framework accepts the computer conferencing environment as one in which students can accomplish both social and educational construction.

What is it about computer conferencing that enables the social and educational construction for students? Honebein (1996) describes seven guidelines for the design of constructivist learning environments. These include embedding learning in social experience and providing experience in, and appreciation for, multiple perspectives. These guidelines fit well with a computer conferencing environment where the sharing of peer perspectives, and interpersonal and group dialogue, contribute to social and learning construction.

Electronic discussions are effective tools for social construction within an online distance environment. They provide democratic opportunities for students to interact with one another as well as their instructor, and to hear other's opinions

and beliefs. The time delay inherent in this technology encourages personal reflection and participation in others' social and learning construction.

Online Communities

The building of online communities through the use of electronic discussion tools is an extension of the previous review of social construction literature. Research in the online environment revolves around the ability to create online communities using electronic discussions. The use of computer mediated communication tools, like electronic mail and bulletin boards, provide opportunities for social presence and expression in a university course. (Rourke, 2000).

In the distance course environment, electronic bulletin boards enable students to form a virtual community where one does not exist physically. This community may be social or knowledge oriented. Working together to accomplish a task is descriptive of what community means. One term for this is collaborative learning. Collaboration is the participation in knowledge communities. (Bruffee, 1993, p.3). In the electronic discussion environment it is the interaction of student-student and student-instructor that is the vehicle for collaboration.

As more students gain experience with computer conferencing, the social context may become inherent in this type of communication tool. Lai (1997) describes analysis of postings in public (non-academic) online discussion boards aimed at students. He discovered that these postings were almost entirely social in nature. The majority of messages were aimed at socializing with peers or making new friends.

Hammond (2000) revealed that students in his study used the electronic discussion medium as a place where they introduced themselves, sometimes shared personal news with each other, shared course information, and participated in structured writing. He suggests that to use it at the next, more communicative level, would require direction and a willingness on the part of the learner to take risks. Ligorio (2001) found that students used different tools or invented new uses for communication tools once they had reached a plateau of awareness about the technical and cognitive functions of that tool. He further explored the interrelatedness of the different tools in an online environment.

Challenges of Electronic Discussion Use

Several challenges have appeared in the research of electronic discussion use. These challenges include: learner confidence, technical problems, and time constraints.

Students may neither see the value, nor feel the pressure to participate in online discussions (as much as they do in face-to-face discussions). Hammond (2000) found this to be the case in his study. He found students lacked confidence in their own opinions, their own writing ability, or the technology itself (often due to technical problems they experienced). These factors influenced some students to participate less or not at all.

The use of electronic discussions, even with thoughtful and effective pedagogy, does not necessarily ensure participation. Cuneo & Harnish (2002) examined the effects of six approaches to learning in online computer conferencing, including what he called "deep learning." He concluded that

approximately fifteen to twenty five percent of first year students were surface learners (memorizing facts, competing with other students for marks) who did not benefit from online discussions. Some of these student expressed performance and time management anxiety related to computer conferencing participation.

Guidelines have been suggested for minimizing problems like lack of student participation and student anxiety. These guidelines include: attaching evaluation to participation, instructor presence, and periodic discussion with students concerning the benefits and challenges of the environment. (Rourke, 2000; Hammond, 1999).

Electronic Discussions in Conventional Classrooms

Some research exists concerning the use of electronic discussions in a conventional classroom as a *supplement* to face-to-face discussions and activities. The use of discussions in conventional classrooms has been identified as complementary, not as replacement for face-to-face discussion.

When compared to face-to-face discussions, the text based medium of electronic discussions increases the requirement for structured expression of thought yet decreases or eliminates the face-to-face interaction practice. So, threaded discussions allow for solid academic interactions with others, but may not be as effective as classroom discussion in teaching how to interact with someone who holds a different opinion. (Larson & Keiper, 2002).

Another study revealed that participants liked online electronic discussions in addition to face-to-face dialogue, but not as a substitution for it. Tiene (2000) concluded that students liked the ability to review and reflect on others' electronic

messages. They also appreciated having the time to more carefully articulate their ideas.

Shy students may be less shy or quiet in an electronic discussion. Fostering student-student and student-instructor interaction in larger classes was the focus of Collins' (1998) research. Student responses to a questionnaire suggested that quiet students in face-to-face discussions were less so in electronic discussions. For some students, discussions were an incentive to increase interest in the course and led to better study habits. The professor liked that the system could be used to communicate announcements, thereby preserving valuable class time for instruction.

Motivation and Achievement

Students may need motivation before they participate fully in electronic discussions. Adding one more activity to their seemingly full plate of course work may not appeal to some students. Students showing higher motivation for computer conferencing were the ones who believed that it was necessary to help them learn the course material (Bures, Abrami and Amundsen, 2000). In addition, several researchers have concluded that student motivation to participate is increased when electronic discussions are integrated into the instructional design of the course (Hawkey, 2003).

Some research regarding the use of computers (in general) and academic achievement has been carried out. For example, Ravitz, Mergendoller, and Rush (2002) found that students who used computers at home scored higher on their achievement tests.

> ... students who score better on standardized achievement tests are those who use computers more often at home, and less at school... Within schools, students who have higher software capability not only score higher on tests but they also gained more, on average ... (pp. 4, 9)

There has been minimal research, however, into the relationship between asynchronous discussions use and student achievement. Intuitively it seems logical that if critical thinking skills are increased through the use of electronic discussions, there should be an increase in student achievement. Cuneo & Harnish (2002) found students who experienced panic and anxiety over posting messages performed poorly academically, but that there was no significant difference for the remaining students. In another study, Larkin-Hein (2001) found that students who had higher participation in electronic discussions performed two letter grades higher, on average, than those who did not. In her study there was no requirement for participation, so it may be that higher academic achievers may be more willing to participate in additional course activities.

Summary of Literature Review

Electronic discussions have been heavily used in online distance education courses to simulate face-to-face discussions. There is evidence of an increase in student-student and student-instructor interaction. Guidelines and frameworks for their use provide new opportunities for developing critical thinking skills.

In a conventional classroom, the addition of electronic discussions can increase dialogue and reflection thereby contributing to the continued

development of social and learning constructs. Studies that explore the relationship between electronic discussion participation and achievement have been limited. However, some studies indicate that integration of electronic discussions as a required component of the course leads to increased student participation in the activity. Other studies conclude that there is increased motivation to participate in electronic discussions when students believe the activity is necessary to learn course material.

Electronic discussions continue to expand and integrate into our work and homes. For example, some instructional technology (IT) professionals visit discussion boards to gain assistance with complex problems or gather expertise from other professionals. Providing students with opportunities to utilize this technology in an educational environment will help them develop new ways of using this tool in other areas of their lives.

CHAPTER III: RESEARCH METHODS

Introduction

This chapter describes the research design, participants, hypothesis, research questions, variables, ethical considerations, data collection and data analysis used for this study.

Research Design

A pre-test/post-test quasi-experimental design was used to investigate the relationship between student participation in electronic discussions and student achievement. In addition, two short paper-based surveys were distributed to capture some data about student experience with electronic discussions, both at the beginning and at the end of the study. The study took place over one-half of a term (8 weeks).

Participants

Study subjects were first-year students enrolled in two different college diploma programs: Information Technology and Systems Management (ITSM), and Information Management and Library Technology (IMLT). Both programs were two years in length and each program contained a minimum of four technology courses that were taught face-to-face in computer labs. Graduates of the ITSM program work in the computer technician field, whereas graduates of the IMLT program work in the library technician field. The majority of students

in both programs were enrolled in two separate courses for which the researcher was the instructor. Course outlines are displayed in Appendix A.

The researcher attempted to obtain sixty participants for this study. Thirty students consented to participate, twelve from the ITSM program and eighteen from the IMLT program.

The majority of the students in each separate group were in both classes. Students were matched so that only one of their participation records and accompanying exam marks was used for the data analysis. The groups and courses that they were taking are listed in Table 1.

Table 1. Study Sample Grouping by Program and Course

Group	Program	Course	n
A	ITSM	MCSP 100	5
A	ITSM	MCSP 101	7
B	IMLT	MCSP 123	16
B	IMLT	MCSP 131	2

All students were taught in a computer lab and used technology during the class. Each student had independent access to a computer during class. As well, the students had twenty-four hour (seven days a week) access to a WebCT course website, from both inside and outside the college.

The study began six weeks after the beginning of the course and ran for an eight week period. This provided instructional and practice time to familiarize

students with the college computer system and their WebCT course website prior to beginning the study.

At the beginning of each course, the students were given an in-class introduction to the available WebCT tools in their course website. In the six weeks prior to the study start date, students were required to utilize most of the following WebCT tools: Grades, Quizzes, Course Outline, Calendar, and Course Content. Prior to the study start date, students were able to perform the following WebCT tasks: check their own assessment results, download lecture files, and take a quiz. WebCT discussions and chat tools were introduced six weeks later, at the beginning of the study.

Variables

The variables examined in this study were: (1) group, (2) program, (3) gender, (4) message length, and (5) message frequency.

Independent Variables

Group: The group variable is a categorical variable having two attributes, "yes" or "no." Students who consented to participate in the study were coded into two groups. Group 1 consisted of those students who did not participate in electronic discussion and Group 2 consisted of those students who did participate in electronic discussions.

Program: The program variable is a categorical variable having two attributes, "A" or "B." Group A consisted of students who were in the Information Technology and systems Management (ITSM) program. Group B

consisted of students who were in the Information Management and Library Technology (IMLT).

Other Variables

Gender: The gender variable is a categorical variable having two options, "M" or "F." The "M" students are male and the "F" students are female.

Message Length: The message length variable is a continuous variable measuring the number of words in a particular student message.

Message Frequency: The message frequency variable is a continuous variable measuring the number of messages posted by a particular student.

Dependent Variable

Post-test score: The post-test score is defined by the student's final exam mark. The post-test score was calculated using only those questions based on material covered during the study. Questions relating to any material covered outside the study time period were stripped from the exam. The exam score was expressed as a percentage and calculated by taking the number of correct remaining questions, dividing by the total number of questions left and multiplying by 100

Controlled Variable

Pre-test score. The pre-test score is defined by the students midterm exam mark. This variable is a quantitative variable expressed as a percentage.

Ethical Considerations

The data collection for this research project began following approval from both of the following groups: the University of Alberta Faculties of Education and Extension Research Ethics Board (EE REB), and Grant MacEwan College Research Ethics Review Committee.

This study followed the University of Alberta's Ethical Principles and Guidelines as well as Grant MacEwan College's guidelines. The ethical guidelines include respect for human dignity, respect for free and informed consent, respect for vulnerable persons, respect for privacy and confidentiality, respect for justice and inclusiveness, balancing harms and benefits, minimizing harm and maximizing benefit.

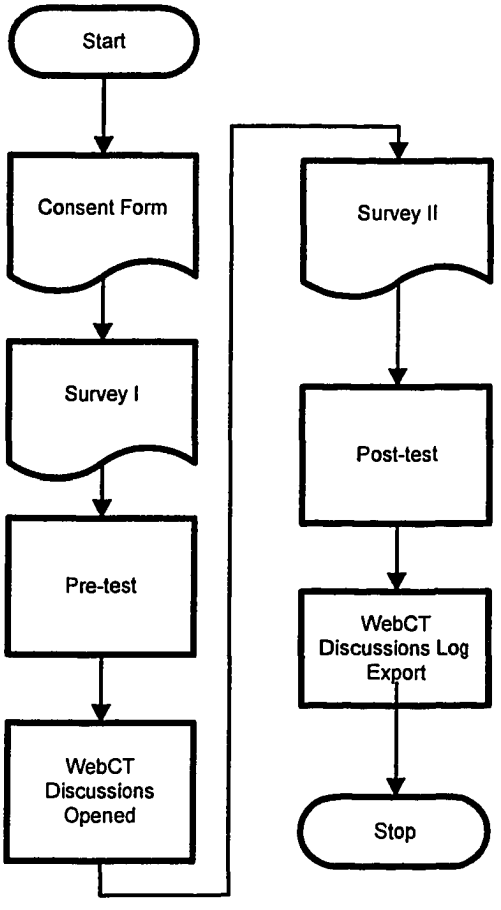
On the first day of classes, the instructor notified the students of the opportunity to participate in this study later in the term. A letter explaining the purpose and nature of the research was provided to participants by the researcher in early October 2003. The letter contained full disclosure of the research project, an invitation for the individual to participate in the project, identity and contact information of the researcher and advisor, as well as indication of any potential harms and benefits that may come out of the research. An example of this letter is shown in Appendix B.

Once the prospective participants reviewed the letter, a consent form was provided. The consent form provided participants with an assurance that privacy and confidentiality would be respected and also advised them that they were free to withdraw from the study at any time.

Procedures

This study took place between October 10 and December 17, 2003. There were several points in the study timeline where quantitative data, such as pre-test and post-test marks, were collected. In addition, at term midpoint and term end, some qualitative data was collected with two surveys. Figure 1 shows the sequence of events in the study.

Figure 1. Sequence of Study Events



The sequence of events, as described in Figure 1, took place between October and December, 2003. The informational letter and ethics consent form as

well as the two surveys were provided in class to all students. As the researcher was also the instructor in all four courses, an additional study implementation aimed at student privacy, suggested by the MacEwan Ethics committee, was implemented. This procedure involved sealing the signed consent forms in an envelope until the end of term.

At the beginning of the course, the instructor invited students to participate in the study, and made them aware of the small amount of time required to complete the surveys. The instructor also discussed possible study benefits for future students and instructors. Six weeks later, those students interested in participating were asked to read the informational letter and complete a consent form. All students were instructed to place their forms back into an envelope, whether they had chosen to participate or not. A student volunteer managed the consent form and survey process while the researcher left the room. This provided the students with privacy regarding their choice to participate or not.

Survey I was distributed within one week from the consent form distribution. Appendix C contains an example of Survey I. The pre-test (midterm exam) occurred approximately one week after Survey I completion.

WebCT electronic discussion boards were opened following completion of the pre-test. The instructor delivered a short, guided demonstration of WebCT discussions in class and encouraged the students to use the tool until the end of term. In addition, students were directed to an online tutorial that explained WebCT Discussions. This WebCT tutorial is in Appendix D.

Each of the courses had a companion course website that the instructor created. Standard tools included: (1) course outline, (2) student marks, (3) course notes, and (4) calendar.

The post-test was the course final exam. Questions on course material that had been covered prior to the beginning of the study were stripped. The final exam marks were calculated as a percentage. At the end of the study, the students were asked to complete Survey II. An example of Survey II is in Appendix E.

WebCT captured each message posting throughout the term. At the end of the term, and following submission of student grades, the message postings for those students who had consented to participate were downloaded from the course site for analysis.

Following the course end date, final exam marks were collected. These marks were adjusted by including only those questions on course material that was covered during the study period. Any material covered prior to the pre-test was omitted.

The consent letter and survey envelopes were opened only after final course marks had been submitted to the college registrar. Then, WebCT messages for those students who had consented to participate, were exported to MS Word™, which was used to count the number of words in each posting. In addition, the frequency of postings for each participant was counted. This data was entered into SPSS™.

It is important to note that participation in electronic discussion was not required in these courses and there was no evaluation mark attached to it.

Instrumentation and Data Collection

Data for this study was collected using the following five instruments.

Survey I

The purpose of this survey was to collect information regarding the participants' previous use of asynchronous and synchronous communication tools. Survey I questions used a Likert scale to determine the frequency and type of participants' prior experience with the use of electronic-discussion tools. In addition, open ended questions were asked regarding the types of electronic discussions tools used in the past. This data was used to provide a qualitative overview of the sample (see Appendix C for an example of Survey I).

Pre-Test

The pre-test score recorded for each student was their midterm exam mark. The pre-test exam in each course was comprised of approximately 25% theory and 75% practical questions regarding some type of technology. ITSM students worked with MS Word™ and covered introductory programming design concepts. IMLT students worked with MS Word™, MS Excel™ and introductory web page construction using Hypertext Markup Language. All exams were administered in a computer lab, with each student having access to their own computer. None of the exams required students to use electronic discussions.

Survey II

The purpose of this survey was to collect qualitative data about participants' experience with electronic discussions, after completing the course.

Survey II questions used a Likert scale to determine the frequency and nature of student electronic discussion use. Additionally, participants were asked open-ended questions regarding the benefits and challenges of using electronic discussions during the study period. The survey was administered during the last week of classes, prior to the post-test (see Appendix E for an example of Survey II).

Post-Test

The post-test score for each student was their final exam mark. The post-test combined theory and practical questions and was administered in a computer lab. Each exam involved some use of technology to complete the exam. None of the exams required students to use electronic discussions.

WebCT Discussions Log

Electronic discussions are recorded text messages that are stored and are viewable to all discussion participants. Individuals interact asynchronously (at different times) on a discussion board. Students, instructors and guests read, post, and reply to messages that all can view.

Following the pre-test, the WebCT™ discussions tool was added to the course website. WebCT™ was used since it is the online course management platform of choice at the institution where this study was conducted. Students were verbally informed of the opening of the discussion board and a short in-class demonstration was provided.

WebCT discussion topics were created and administered by the researcher. Students were able to add (post) messages and encouraged to thread them in appropriate topic areas. The discussion topic areas included: (a) assignments, (b) software product or concept help, (c) exam resources, (d) other resources, and (e) online café.

At the end of the term, once the students who consented to participate were known to the researcher, message postings were copied into a MS Word™ document, under a random number to ensure student privacy.

Data Analyses

To explore the above hypotheses, the analysis of covariance (ANCOVA) method was used to determine if there is a difference of means between groups on post-test achievement, while controlling for pre-existing differences in the group. A covariate, student pre-test scores, was used to control for the use of intact groups (non-random selection). "...Means of the dependent variable in the various groups are adjusted to correspond to the same mean values of the covariates and then compared by the usual analysis of variance tests." (Everitt & Hay, p. 81) In addition, some qualitative data was gathered through the use of two surveys.

In this study, an alpha level of .05 was used for tests of statistical significance, unless otherwise noted. This alpha level is a standard value used to describe the upper limit for the probability of incorrectly rejecting a true null hypothesis. If the observed significance level of a test was not greater than this

value, that is $p \leq 0.05$, the null hypothesis was rejected. All statistical calculations in this study were computed using SPSS™ 11 for Windows.

Controlled Variable – Pre-Test

The pre-test variable was used as the covariate in the analysis. Midterm exam marks were used as the pre-test scores. The pre-test mark captures the pre-existing differences between groups in this study. The pre-test score will be used in the ANCOVA to identify whether a significant post-test difference of means exists for students based on their WebCT discussion participation, while controlling for previously existing differences in these intact groups.

Missing Data – General Academic Ability

Additional data such as grade point average (GPA) or high school marks were not available to the researcher. It was assumed that participants had obtained minimal entrance requirements. The pre-existing difference in groups was compensated for by using the pre-test as a covariate.

Descriptives

Descriptive statistics (frequency tables, means and standard deviations) were produced for variables involved in this study. These provided a general picture of the pre-test and post-test scores for participants.

Testing the Hypothesis on Student Discussion Participation

The hypothesis stated that students who participated in electronic discussions will attain higher grades than students who did not participate. To test

this hypothesis a two-way ANCOVA was used. If the significance value was below .05 for the independent variable, while controlling for the pre-test differences between the groups, the hypothesis would be supported.

Research question one asked if there were differences between the two programs (ITSM and IMLT) for the frequency of participants' message postings and the length of participants' message postings.

Question two asked if there was a difference between gender for the frequency of participants' message postings and length of participants' message postings.

Instruments

Instruments used in this study included a pre-test survey, a pre-test, a post-test survey and a post-test.

The pre-test and post-test surveys (see Appendix C and E) were constructed by the researcher and reviewed by a colleague. Prior to use, some adjustments were made based on feedback received.

For each course, the course midterm exam mark was used as the pre-test score and the course final exam mark was used as the post-test score.
The pre-tests and post-tests were developed by the researcher. They were identical to (or modified versions of) previous exams that had been used by the researcher or other instructors. These exams do not have strong reliability. Likely reasons for this are: a small number of consenting participants, and removal of numerous questions from the post-test (final exams).

Survey I and Survey II provide qualitative data for this study. The participants were asked to answer forced choice and open ended questions.

WebCT™ captured all electronic discussion postings. Once consenting study participants were known, student messages were copied to MS Word where student names were replaced using a random number scheme.

CHAPTER IV: RESULTS

Introduction

The purpose of this chapter is to report the results from the surveys and to analyze the difference in means for the post-test marks. The surveys were used to collect participant information regarding their use of asynchronous and synchronous communication tools at the beginning and end of the study. This data provided a qualitative overview of the sample (see Appendix C for an example of Survey I and Appendix E for an example of Survey II).

The number of consenting study participants remained unknown until the end of the term. Of the sixty possible participants, thirty students consented and are the participants discussed in the following section. The study was analyzed by looking at two groups of participants: those that did participate and those that did not participate in electronic discussions.

There were two types of data collected: quantitative and qualitative. The quantitative data included each student's pre-test score (midterm exam mark), post-test score (final exam mark), gender, electronic discussion message frequency, and message lengths (WebCT™ discussions log).

The qualitative data was the result of two surveys. Survey I was administered at pre-test time and Survey II was administered at post-test time. These surveys provided additional information about student experience with electronic discussions at the beginning and end of the study.

Electronic Discussion and Academic Achievement

Collected data was analyzed by determining the mean, variance, and standard deviation for each group and program. General descriptive statistics provided an overview of the data and was followed by ANCOVA. ANCOVA was used to explore differences of means for post-test scores, while controlling for initial differences between groups using the pre-test score as a covariate.

Table 2 shows the overall pre-test and post-test scores for all participants as a function of involvement with electronic discussions. The descriptive statistics for the data displayed include the number of participants (n) and mean (M).

Table 2. Pre-test and Post-test Mean Scores for all Participants

Participation	Pre-test M	Post-test M	n
No	78.8	72.7	13
Yes	85.5	86.3	17

Table 2 shows the differences in post-test performance of students based on their participation in electronic discussions. There was an increase of 13.6 on the post-test score for students who participated in electronic discussions as compared to those students who did not participate in electronic discussions. There was an increase in pre-test scores of 6.7 at the beginning of the study.

Table 3. Pre-test and Post-test Standard Deviation Values for all Participants

Participation	Pre-test SD	Post-test SD	n
No	14.5	29.7	13
Yes	12.1	8.7	17

Table 3 shows the standard deviations are greater for those students who did not participate in electronic discussion, and suggests closer scrutiny of the data is needed.

Table 4. Comparison of Program Mean for Pre-test and Post-test Scores

	ITSM			IMLT		
Participation	n	Pre-test M	Post-test M	n	Pre-test M	Post-test M
No	6	76.7	84.0	7	80.6	63.1
Yes	6	79.1	81.8	11	88.9	88.8

Table 4 compares the program mean for each of the two programs (IMLT and ITSM) as a function of involvement with electronic discussions. There is a large pre-test to post-test mean decrease of 17.41 for IMLT students who did not participate in electronic discussions. This difference in pre-test means suggests the groups were not initially equivalent.

Table 5. Pre-test and Post-test Standard Deviation Values for all Participants

	ITSM			IMLT		
Participation	n	Pre-test SD	Post-test SD	n	Pre-test SD	Post-test SD
No	6	12.8	13.8	7	16.6	37.1
Yes	6	13.5	10.5	11	10.4	6.9

The standard deviations displayed in Table 5 show a difference between students who participated in electronic discussions and those that did not. In both ITSM and IMLT, those students who did participate in electronic discussions had a decrease in standard deviation, whereas those students who did not participate in electronic discussions had an increase in standard deviation.

A qualitative analysis of the pre-test revealed some difficulties for a larger number of the IMLT students than the ITSM students, with regards to the basics of computer use. Specifically, more students lost exam marks on knowledge and performance skills related to file management and web browser skills.

At the end of the course, both groups were post-tested with a final exam in each course. The exams consisted of a theory section (multiple choice and short answer) along with a technology productivity (hands on) component.

To control for the differences between groups on the pre-test, ANCOVA was used to further analyze the data. Post-test scores were used as the dependent variable and pre-test scores as the covariate. ANCOVA provided adjusted group

difference in means while controlling for the pre-existing differences caused by sampling error and reduction of the size of the error variance of the analysis.

The use of the pre-test score is a significant covariate ($F(1,25) = 6.978$, p=0.014) and therefore able to account for a significant amount of variance in the post-test scores. In addition, the interaction between the participation variable and program variable is not significant.

The research data satisfied the ANCOVA assumption of homogeneity of regression. The interaction of the covariate with program and then with group was used to determine if the required ANCOVA assumption of parallelism of slopes was met. Figure 2 and Figure 3 show this parallelism.

Figure 2. Pre-test and Post-test Scores by Program

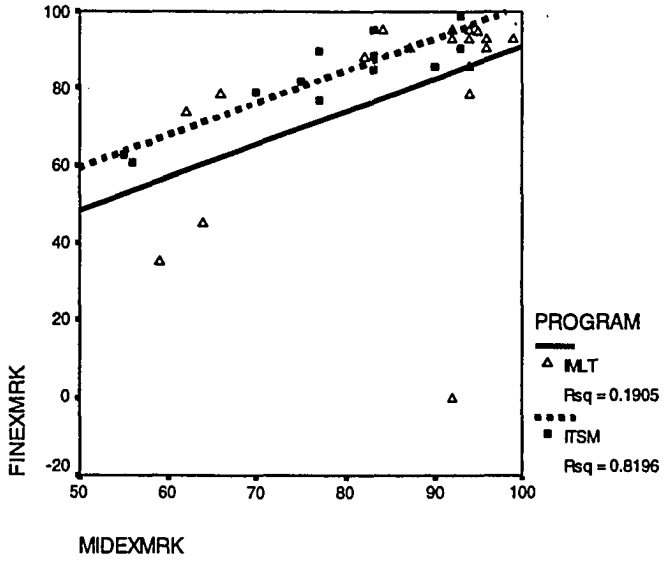
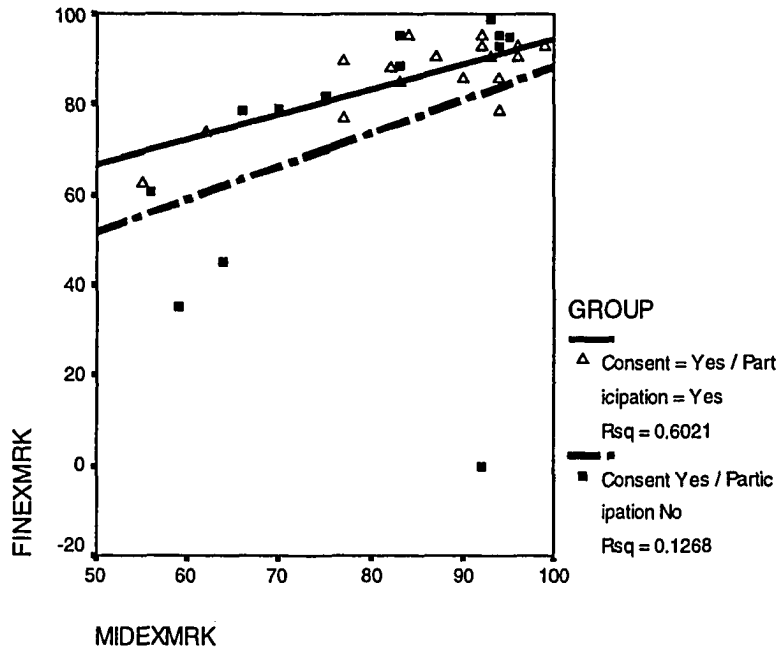


Figure 3. Pre-test and Post-test Scores by Participation



A two-way ANCOVA was performed. Post-test scores were added as the dependent variable and pre-test scores as the covariate. The adjusted means, while controlling for student's pre-existing differences, were different than the raw mean of the post-test scores and are displayed in Table 6.

Table 6. Raw and Adjusted Mean of Post-Test Scores

Participation	n	M	Adjusted M	SE
No	13	72.7	76.3	5.084
Yes	17	86.3	84.2	4.553

Table 6 displays the means as adjusted by ANCOVA, using the pre-test score to control for pre-existing differences between the groups. There is an increase in the adjusted post-test mean of 3.5 over the original mean for the no-

participation group. Those that did participate in electronic discussions had an adjusted mean decrease of 2.1.

ANCOVA provided adjusted group difference in means while controlling for the effect of pre-existing differences, as measured by the pre-test. The ANCOVA results are displayed in Table 7.

Table 7. ANCOVA Results for Post-Test Scores

Source	*df*	*F*	Sig.
Pre-Test	1	6.978	.014
Participation	1	1.313	.263
Program	1	2.841	.104
Participation X Program	1	3.070	.092

Using the guideline that if the computed F score is greater than 1, then there is more variation between groups than within groups, the results indicate that there is some variation in difference of means.

After adjusting for pre-test scores, the ANCOVA results show some variation, but no significant effect for the participation group ($F(1,25) = 1.313$, $p = 0.263$). The students who did participate in electronic discussions did not have a significant difference in means from those who did not participate.

After adjusting for pre-test scores, the results show more variation, but no significant effect of the program that students were in ($F(1,25) = 2.841$, $p = 0.104$). The ITSM and IMLT students did not have a significant difference in means.

After adjusting for pre-test scores, the results show more variation than either variable alone, however, there is still no significant effect of the group and program interaction ($F(1,25) = 3.070$, $p = 0.093$). Thus, the students in ITSM and IMLT who did or did not participate in electronic discussions were not significantly different with regards to their mean scores.

Message Frequency and Length Analysis

The study sample involved two programs of students, each taking two different courses. The portion of the sample that participated in electronic discussions was examined from two perspectives: (1) comparison by program of message frequency and length, and (2) comparison by gender of message frequency and length. That is, the data for the group of students who posted at least one message were analyzed for frequency and length of postings.

With regards to message length, there was a significant difference between the programs ($t=6.068$, $df=15$, $p=.01$). The mean length of postings for ITSM students was 118.75 words, whereas the mean length of postings for IMLT students was 50.95 words. This is a difference in means of 67.8 words between the two programs. ITSM students wrote messages that were, on average, 67.8 words longer than IMLT students. There was no significant message frequency difference between the two programs ($t=.561$, $df=15$, $p=0.0561$).

For the group of students who posted at least one message, frequency and length of postings for male and female postings were also examined. There was a significant difference between males and females with respect to the length of the messages ($t=3.101$, $df=15$, $p=0.01$). Males wrote messages that were, on average,

48.1 words longer than females. There was no gender difference for frequency of postings (t=1.012, df=15, p=0.328)

Experience with the use of Electronic Discussions Tools

Two surveys were administered to determine student experience with the use of electronic discussion tools. The first survey (Survey I) was administered at the beginning of the study. The results of Survey I are shown in Table 8. The second survey (Survey II) was administered at the end of the study. The findings of this survey are in Table 9.

Table 8. Electronic Discussions Experience at the Beginning of the Study

		ITSM (n = 12)		IMLT (n = 18)	
Survey I Question	Choices	Yes	No	Yes	No
Previous experience		6	6	7	11
Average use per week	1	2	0	1	0
	2-3	3	0	4	0
	6+	1	0	2	0
Purposes for using electronic discussion	School/Work	4		0	
	Recreation	2		6	
	Research	0		1	
Types of electronic discussions or chat tools used in the past		ICQ, MSN, Yahoo, Trillian, Outlook, ASPChat		Chat rooms, BBS, ICQ, MSN Messenger	

The Survey I results (Table 8), identify ITSM students having had more experience with discussion tools than IMLT students at the beginning of the study. Students in both programs used the tools for recreation, however, the IMLT program had more previous use in the recreation area (six of the seven respondents) than the ITSM respondents (two of the six).

More ITSM respondents had used the tool for school/work (four of the six) in the past. Only one IMLT student had used it for research.

At the end of term, Survey II was completed by study participants. Twelve ITSM students and fourteen IMLT students responded. The findings of Survey II are shown in Table 9:

Table 9. Electronic Discussions Experience at the End of the Study

		ITSM (n = 12)		IMLT (n = 14)	
Survey II Question	Choices	Yes	No	Yes	No
Used WebCT discussions during study		9	3	5	9
Average times used per week	1	4		1	
	2-3	2		3	
	4-5	2		0	
	6+	1		1	
Purposes for using electronic discussion	School/Work	8		0	
	Recreation	2		3	
	Research	0		1	

Of the thirty students who consented to participate in this study, twenty six completed Survey II.

Comparing the results of Survey I with Survey II shows an increase in the number of ITSM students using electronic discussion for school or work, whereas the IMLT respondents continued to use the tool primarily for recreation.

In addition to the questions and responses in Table 9, Survey II included two open ended questions about WebCT electronic discussions. Two themes emerged from the fourteen student responses to the following questions.

(1) What were the positive outcomes you gained using WebCT discussions in this course?

(2) What were the challenges/difficulties using WebCT discussions in this course?

Theme 1: Timely Response to Questions

Eight respondents wrote that help with assignments and questions was a positive outcome of electronic discussion use.

An example of one student comment from this question in the survey was, "Help with assignments-strategies, and missing files, project and assignment instructions."

Theme 2: Communication with Classmates

Three respondents wrote that communicating with their classmates was a positive outcome of electronic discussion use.

An example of student response from this question in the survey was, "Keep in touch with (the) class."

The following additional student responses are categorized by common areas.

- Three respondents wrote that they had difficulty, or were unsatisfied, with the WebCT Discussions tool. An example of a student comment regarding difficulty using WebCT Discussions was, "WebCT is not very user friendly. It's not hard to use, it's (just) annoying."
- Two respondents indicated that either their own or other student's lack of participation was a challenge. An example of this type of response was, "Not enough people used it."
- Three students responded about time related challenges. One student was not able to "keep up," while another student could only "read a few" of the postings.

Summary of Chapter IV

The results presented in this chapter began with a quantitative analysis of the relationship between the use of electronic discussions and academic achievement and ended with a discussion of students' experiences with the use of electronic-discussion tools. There were some differences in the means for the groups that participated versus those that did not, however, the differences were not significant.

Within the group that did participate in electronic discussions, there was a significant difference between males and females in terms of the length of message, but no significant difference in the frequency (number) of messages posted.

The two surveys that were administered revealed several areas of note: students are positive about the quick response to questions, and keeping in touch

with the class. Challenging comments included difficulty using WebCT, lack of participation by others or themselves, as well as the concern over the time required to participate.

CHAPTER V: DISCUSSION

Introduction

The purpose of this study was to examine the relationship between electronic discussion participation and student achievement in a conventional college classroom. The discussion that follows looks at the hypothesis and research questions that were asked as well as the results of the qualitative data analysis in the previous chapter. This chapter will end with recommendations for further research and a conclusion.

Academic Achievement and use of Electronic Discussions

Hypothesis

The results of this study do not support the hypothesis, which stated that those students who participate in electronic discussions achieve higher grades than those students who do not participate. Although there was some evidence of a difference in means variation for participation, especially with respect to the participation level (group variable) and program interaction, it was not a significant variation.

Areas of interest in the quantitative data analysis that may have affected the results of this study include pre-test differences between programs and the variety of pre-tests and post-tests used.

The pre-test differences in means between ITSM and IMLT students revealed in the initial overview of descriptive statistics, was investigated further.

A qualitative review of the exams revealed some difficulties for a larger number of the IMLT students than the ITSM students, with regards to the basics of computer use. Specifically, more students lost exam marks on knowledge and performance skills related to file management and web browser skills.

The amount of previous student experience with technology may have accounted for this initial difference. Survey I results indicate that 50% of ITSM students had used electronic discussion before, whereas 38.9% of the IMLT students had. This may have also been the case for their previous experience with technology in general, however data had not been collected concerning this variable.

The participation levels were low from all classes. An explanation for this, may be that none of the classes required students to post messages. That is, there was no incentive for them to participate and so less of them chose to. This concurs with previous study literature that has observed less interaction among classmates when there is no requirement to post (Larson & Keiper, 2002).

Collecting data concerning student access to non-school computers would have been helpful. Some research indicates that those students who have access to computers at home have higher academic achievement. (Ravitz et al., 2002).

Gender and Participation Research Questions

A resulting area of interest regarding frequency and length of postings with regards to gender was examined. The mean length of a posting differed by 48.133 words between males and females, (significance of .007), with male

postings being longer. The frequency of postings differed by 1.014, a significance level of .328.

Student Perspective

Based on the second survey results, many of those students who participated in electronic discussions found both added value and challenges. There was a larger number of positive student comments than challenges.

Positive Outcomes: Use of Electronic Discussions

Several themes regarding positive outcomes from the use of electronic discussions emerged from the fourteen student responses to this question.

A timely answer to questions was the most popular benefit students responded about. Eight respondents wrote that help with assignments and questions was a positive outcome of electronic discussion use. One student wrote the following.

> I found that other students were able to help me past a point in an assignment that I was stuck at by answering my questions on WebCT. I didn't have to wait to ask question(s) until next class.

Other students also responded about the benefits of electronic discussions in obtaining assistance with course material. One student wrote "Learned from others questions," and a different student responded with "Got some ideas which helped me complete assignments."

More general message postings appeared to promote a sense of community that continued outside the classroom. Students wrote about keeping

in touch with classmates or being glad to see other students have similar problems.

Challenges: Use of Electronic Discussions

Some of the respondents identified challenges they experienced when using electronic discussions during this study.

Several students had difficulty with the electronic discussions technology. One student responded that "WebCT is not very user friendly. It's not hard to use, it's annoying." Another student stated that "(I) Never did figure out how to get rid of messages." These students may have been referring to the fact that WebCT discussion does not permit someone to delete their own message. Only the course designer or instructor has the ability to delete messages.

Lack of participation on the discussion board was another area respondents mentioned. One student wrote, "Not enough people used it," while another student wrote "I only looked at a few postings."

For some students, use of the technology or time constraints may have been the difficulty. Student responses such as "Sorting through the non-relevant messages," "Keeping up," and "Understanding the threads" suggest some additional training or incentive may have been helpful.

As we use electronic discussions in classrooms, we may be trying to reproduce the conventional classroom discussion, but this may in fact be a new way to communicate that provides benefits of its own.

Recommendations for Further Research

As there is limited research on academic achievement and the use of electronic discussion, more research is required in this area. Further exploration of other variables related to the number and content of student postings and identifying previous general computer experience and academic background would be additional areas to include in a study design.

Continued exploration of conventional classroom use of electronic discussions may provide further insight into instructional design choices and student motivation to participate. In addition, size of the discussion groups is an area that appears to have little research. What is an electronic discussion like in a class of 15, or 30, or 50, and so on?

What about the "quiet students?" There are some students who do not post messages in electronic discussions, however, they do read the postings and keep up with the dialogue. How do we invite them into the electronic discussions? Students who do not overtly participate in electronic discussions may be more willing to sharing their ideas with classmates if they perceive an electronic format to be more conducive for them to talk. (Larson & Keiper, 2002).

In this study, students reported that electronic discussions enabled timely course assistance, and provided additional contact opportunities with classmates and instructors. This is similar to some findings found in distance education environments. Research suggests that the use of electronic discussions in distance education can enhance social presence, critical thinking, and constructivist

learning. It would be interesting to explore whether it has similar impact in conventional, face-to-face settings.

Conclusion

This study found that, for this sample, student achievement was not significantly related to student participation in electronic discussions. Specifically, student achievement did not increase, nor did it decrease, for students who participated in electronic discussions. However, previous research concerning variables related to quality or durability of learning, as well as student survey results from this study, suggest it is beneficial to add electronic discussions to conventional classrooms.

Electronic discussions participation has been shown to have a positive relationship with critical thinking and with building community. (Knowlton, 2001; Rourke, 2000; Hammond, 2000, Larson & Kieper, 2002). In addition, this study revealed that students find the timely feedback and ability to reach classmates and instructors outside their defined conventional classroom time and place valuable.

There was a significant difference in the mean length of postings. Messages posted by males were longer than messages posted by females. However, there was no significant difference in the frequency of postings between males and females.

Approximately 43% of the students in this study did not participate in electronic discussions. Integration of electronic discussions into the instructional design of the conventional classroom can increase the number of participants.

Two strategies suggested in the literature, and that should be considered in future to increase the number of participants, include: (1) applying an evaluative weighting to electronic discussion participation and, (2) instructor presence and facilitation of discussions

This study and previous research regarding electronic discussions use are relevant to conventional classroom college instructors and professional development departments. One of the primary sources of instructional techniques for conventional classroom college instructors are workshops and training documentation. Providing instructors with explanations of the benefits and strategies for implementing both face-to-face and electronic discussions is recommended.

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APPENDIX A: COURSE OUTLINE EXAMPLES

MCSP 100 Logic and Problem Solving Course Outline

Credits: 3.0
Term: Fall 2003
Total Hours: 45.0
Prerequisites: None
Instructor: Raina Rudko-Buac
Text Book: Robertson, L. (2002). Simple Program Design, 3rd Edition, Course Technology.

COURSE DESCRIPTION:

This course provides a foundation of knowledge that integrates into other courses in the Information Technology and Systems Management program. Topics include practical problem solving, decision making, binary number systems, diagramming techniques, and programming basics.

Learning Outcomes:

Upon completion of this course, the student will be able to

- Compare several computer industry professional code of ethics.
- Explain and use appropriate step sequences in problem solving.
- Manipulate numbers using various bases (2, 10, 16).
- Transform arithmetic formulas into straight-line formulas.
- Transform text data into information with string manipulation.
- Create diagrams to represent ideas.
- Differentiate programming variable types (numeric, string, Boolean).
- Identify the decision making structured programming blocks (selection, sequence).
- Identify the iteration structures programming blocks (Do-While and For loops)
- Use flowcharts and pseudocode to represent programming solutions.
- Use Boolean operators AND, NOT, OR in programming solutions.
- Apply logic, problem solving and team skills to perform Robolab tasks.
- Create logic diagrams and programming code for Robolab tasks.

Evaluation:

Assignments

Assignment 1	5%
Assignment 2	7.5%
Assignment 3	7.5%
Assignment 4	7.5%
Assignment 5	7.5%
Assignment 6	10%
Total	**45%**

Quizzes & Exams

Quiz 1	10%
Midterm	15%
Final Exam	30%
Total	**55%**

MCSP 101 Workplace Skills and Concepts Course Outline

Credits: 3.0
Term: Fall 2003
Total Hours: 60.0
Prerequisites: None
Instructor: Raina Rudko-Buac
Texts: 1) Parsons, Oja, New Perspectives Series Computer Concepts, 5th Edition (with CD), Course Technology Inc.
2) Zimmerman, Zimmerman and Schaffer, New Perspectives on Word 2002 – Comprehensive Enhanced, Course Technology Inc., 2002.
3) Handout – Workplace Employability Skills Course

COURSE DESCRIPTION:

The Workplace Employability Skills portion of this course introduces the student to topics for personal success. Learner skills are developed in the areas of thinking, communication, personal management and teamwork. Students have the opportunity to practice the generic skills and attributes identified by the Conference Board of Canada that will provide program graduates with a sound basis for their futures in the constantly changing job market.

This course also deals with word-processing skills and computer concepts. Word-processing skills will involve the use and understanding of application features that will enable the student to create professional looking documents. Concepts will include computer definitions, terminology, industry trends, and other key topics for the information systems professional.

Learning Outcomes:

1. Workplace Employability Skills
   - Develop the employability skills necessary for success in the workplace.
   - Gain an overall understanding of your current practices that contribute to being employable, and the personal challenges that you face in enhancing your employability skills.
   - Apply the principles of learning and critical thinking, and the employability skills that you will gain during the course to the workplace.
   - Develop an Employability Skills Portfolio that you can build upon for seeking employment in your chosen field.
2. Word Processing
   - Create, edit and format a document
   - Work with multiple-page reports using sections, tables, and tab stops
   - Utilize desktop publishing tools
   - Create styles, outlines, and tables of contents
   - Create form letters and mailing labels
   - Integrate Word with other programs and the Web
   - Automate your work using styles, templates, auto correct, auto text
   - Create on-screen forms
   - Manage long documents using Master and Sub Documents
3. Computer Concepts – discuss and demonstrate competence in the following areas and apply your knowledge to selected workplace simulations:

- Essential computer concepts
- Software and multimedia applications
- Documents, worksheets and databases
- Computer files and data storage
- Computer architecture
- The computer marketplace
- Local area networks and e-mail
- The Internet
- Data security and control
- Data representation
- Communications systems infrastructure
- Information systems in organizations
- Developing effective information systems

Additionally in this course you will:

- Demonstrate work habits and professional behavior compatible with business standards
- Demonstrate regular and punctual class attendance
- Accept responsibility for your own learning
- Complete assigned tasks on time

Evaluation:

Students **MUST** retain a back-up copy of all assignments, exams, quizzes, etc, to verify work done. This is to protect you the student due to system errors that may occur when the originally work is submitted. Failure to do so may result in a grade of "0" on that assignment, exam, or quiz if your work cannot be verified.

It is the responsibility of the student to follow the course outline. The instructor will not necessarily remind you of upcoming exams and due dates.

Evaluation:

Topic	Assignment/Exam	Marks
Workplace Employability Skills	Employer's Perspective	10
	Employability Portfolio	10
	Learning Journal	10
	Learning Plan	10
Computer Concepts	Labs	10
	Quizzes	15
True Colors	Personality Styles Inventory	5
Word 2002	Multiple Page Report	2
	Desktop Publishing	2
	Styles, Outlines	2
	Collaboration Paper	10
	On-screen Forms	2
	Form Letters and Labels	2
Quiz	Concepts, Word, and Workplace Skills	10
Midterm Exam	Concepts, Word, and Workplace Skills	20
Final Exam	Concepts, Word, and Workplace Skills	40
	TOTAL	160

MCSP 123 Web Browsers and the Internet Course Outline

Credits:	3.0
Term:	Fall 2003
Total Hours:	45.0
Prerequisites:	None
Instructor:	Raina Rudko-Buac
Text Book:	Shelly, Cashman, et. al. (2002) HTML Comprehensive Concepts and Techniques, 2nd Edition, Thomson Course Technology.

COURSE DESCRIPTION:

After completion of this course the student will be able to use a variety of Internet tools and describe how the Internet functions. Course activities include creation of web pages, file transfer execution, online and in-class discussion of Internet issues and set-up/use of standard Internet applications.

Learning Outcomes:

Upon completion of this course, the student will be able to

- Describe Internet architecture and TCP/IP protocols.
- Customize basic web browser appearance and functionality.
- Find resources on the WWW, using search tools ilke directories, search engines and clearinghouses.
- Identify and use netiquette and safety guidelines in online communications.
- Use an electronic mail application to transfer and manage messages.
- Subscribe to mailing lists, distribute messages and utilize basic listserv commands.
- Perform file transfer with an industry standard FTP tool.
- Identify basics of webpage design and website file structure.
- Differentiate between HTML, DHTM, XML and XHTML.
- Use XHMTL to create web pages that incorporate components such as images, links, tables, frames, forms, cascading style sheets and character formatting.
- Incorporate simple JavaScript code into a web page.

Evaluation:

Assignments

Assignment 1	10%
Assignment 2	10%
Assignment 3	10%
Assignment 4	5%
Assignment 5	15%
Total	**50%**

Quizzes & Exams

Quiz 1	7.5%
Midterm	15%
Quiz 2	7.5%
Final Exam	20%
Total	**50%**

MCSP 131 Business Computing Course Outline

Credits:	3.0
Term:	Fall 2003
Total Hours:	45.0
Prerequisites:	None
Instructor:	Raina Rudko-Buac
Text Book:	Parsons and Oja, et al. (2002) New Perspectives in Microsoft Office XP, Windows XP Edition, First Course, Course Technology. ISBN: 0-619-18594-5

COURSE DESCRIPTION:

This course explores PC-compatible business software applications in the computer lab. Topics covered will include industry standard word processing, spreadsheet and database programs for the Windows environment.

Learning Outcomes:

Upon completion of this course, the student will be able to

- Perform basic windows functions
- Identify and describe the major components and peripherals of a microcomputer system
- Perform basic surfing on the Internet to research information for business, entrepreneurial or academic applications
- Demonstrate the use of computer manuals and on line help to perform tasks, assignments and tested material
- Create and edit short and long documents using various word processing techniques
- Build a business spreadsheet using simple formulas and functions
- Use a spreadsheet to create a simple line bar and pie charts
- Perform operations using a database to create, edit, format, save, open and use simple sorts, create a table, perform simple queries and print reports
- Transfer and receive files from a network
- Design a 5-slide presentation with test, graphics, and loops
- Use WebCT as a communication tool

Evaluation:

Assignments

Assignment 1	5%
Assignment 2	7.5%
Assignment 3	7.5%
Assignment 4	7.5%
Final Project	12.5%
Total	**40%**

Quizzes & Exams

Quiz 1	7.5%
Midterm Exam	20%
Quiz 2	7.5%
Final Exam	25%
Total	**60%**

APPENDIX C: SURVEY I EXAMPLE

Course Name
Survey I – Research Project

In an effort to assess your experience level and proficiency with electronic discussions tools, please complete the following form. Your feedback is important and appreciated.

1.	Have you used an electronic discussion tool before? (Also known as an electronic board, computer conferencing or threaded discussions tool)		Yes No
If you answered **yes** to **question 1**, please answer questions 2 and 3. Otherwise proceed directly to question 4.			
2.	In the last year, how many times **per week, on average**, have you used electronic discussion tools?		1 2-3 4-5 6 or more
3.	What are the purposes for your use of electronic discussion tools? Please rank the choices from 1 to 4, where 1 is the most frequent use and 4 is the least frequent use.		____Recreation/Entertainment ____School/Work related ____Research ____Other (please specify_
4.	Have you used a chat tool before? (Also known as Instant Messaging or chat rooms).		Yes No
If you answered **yes** to **question 4**, please answer questions 5 and 6. Otherwise proceed directly to question 7			
5.	In the last year, how many times **per week, on average**, have you used chat tools?		1 2-3 4-5 6 or more
6.	What are the purposes for your use of chat tools? Please rank the choices from 1 to 4, where 1 is the most frequent use and 4 is the least frequent use.		____Recreation/Entertainment ____School/Work related ____Research ____Other (please specify_

7. What are the types (names) of electronic discussions or chat tools that you have used in the past?

8. What are the types (names) of electronic discussions or chat tools that you currently use?

APPENDIX D: WEBCT TUTORIAL NOTES

What are discussions?

"Discussions" is a place where messages can be posted for public display. On the Internet, and in some of the online modules, a Discussion may also be called a bulletin board or a **forum.**

In WebCT, Discussions is the main tool and topics are the items to be discussed.

A Discussion can be used :

- as a place where students can discuss general issues
- to discuss case studies or learning material with lecturer
- by a group of students to discuss or present an assignment
- to post general messages from the lecturer
- to organise related discussions

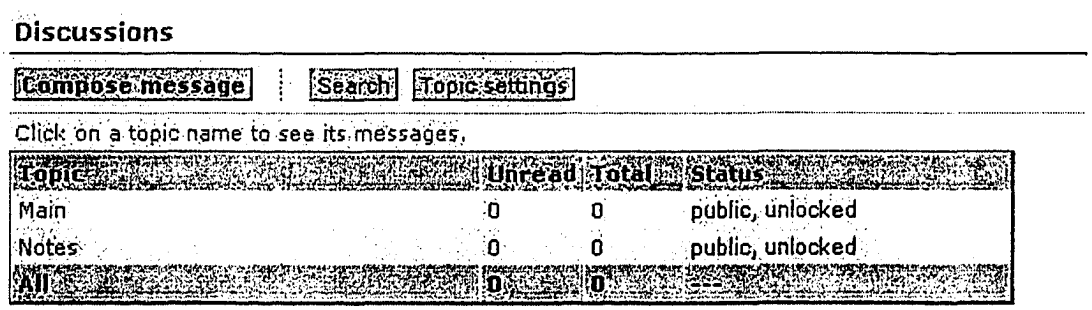
This icon will be displayed if you have a **new message.**

The Discussions layout is very similar to that of the e-mail window. The main difference between the Discussions tool and Mail is that when you post a message in a topic, **everyone** sees the posted messages.

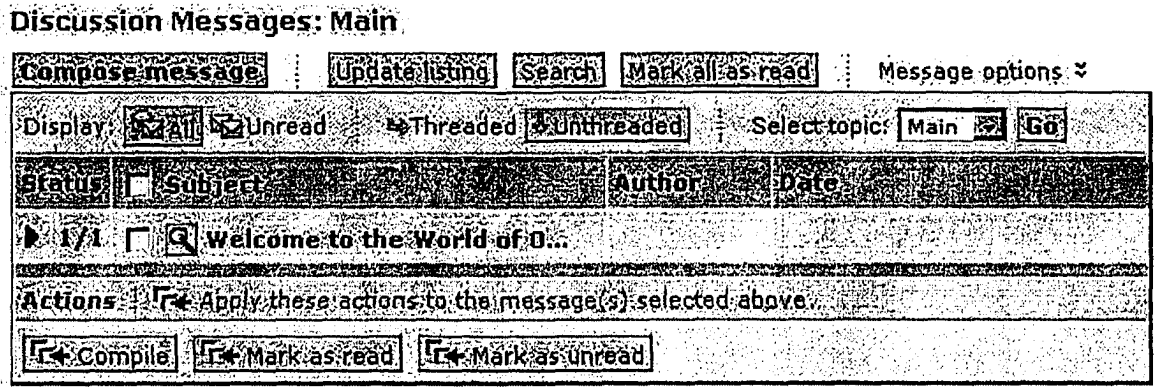
Bulletin boards are used to ask questions about the course. The questions can be general or specific. They are open to all readers and can be answered by students or instructors.

You are also encouraged to answer questions that other students have posted.

When you select the Discussions tool, by clicking on the menu link or on a Discussions icon, you will be taken to a topic listing window.



Click on the Topic, for example **Main**, to see the postings. (If you click on **All** you will see all postings for all available topics). You will see a screen similar to:



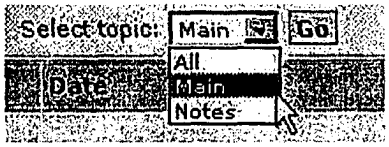
To post a new message, click on **Compose Message**, enter the text, and then click the Send button.

Be sure to press **Update the Listing** after reading/composing messages so that the latest information is displayed. Check also that the Topic list is showing the correct topic for your message(s).

To Navigate in the Discussions Tool

Use the Discussions link in the **breadcrumb trail** to **return to the main Discussions** topic listing. Don't forget to use the online Help if you are not sure about using the Discussions tool.

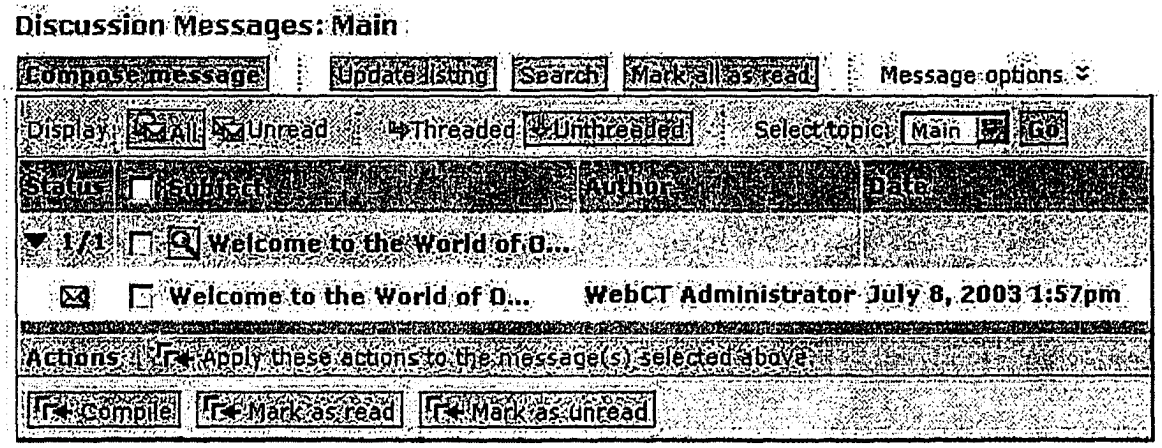
Topics may be set up for particular subjects. Click on the **Topic** dropdown box to see the different topics that are available as displayed in the image below:



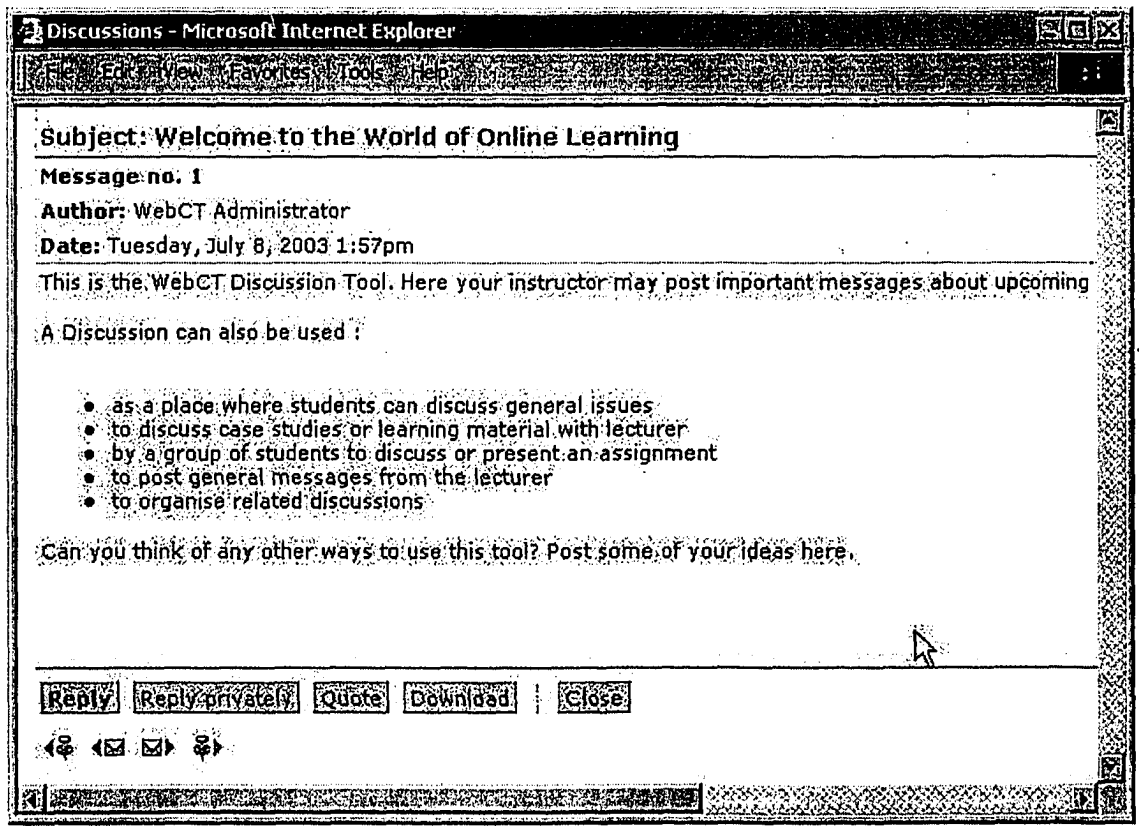
As in the e-mail, messages can be sorted, and you can display All, Read or Unread messages by using the Show option.

Viewing and Reading Messages

To view a posted message, select the ▶ to the left of the message subject (or thread). The ▶ will now change to ▼ and you will see the messages under that thread. Messages which have **not been read** will have a ✉ icon next to the message.



To read the message click on the bolded blue text, "**Welcome to the World of O...**", a window will open displaying the message.



To reply to this posting, click on Reply.

APPENDIX E: SURVEY II EXAMPLE

Course Name
Survey II – Research Project

In an effort to analyze your experience level with electronic discussions tools in this course, please complete the following form. Your feedback is important and appreciated.

1.	Did you use WebCT discussions in this course?		Yes No
If you answered **yes** to **question 1**, please answer questions 2 and 3. Otherwise proceed directly to question 4.			
2.	How many times **per week, on average**, did you use electronic discussion tools?		1 2-3 4-5 6 or more
3.	What was the purposes for your use of WebCT discussions in this course? Please rank the choices from 1 to 4, where 1 is the most frequent use and 4 is the least frequent use.		____Recreation/Entertainment ____School/Work related ____Research ____Other (please specify_
4.	Did you use WebCT Chat in this course?		Yes No
If you answered **yes** to **question 4**, please answer questions 5 and 6. Otherwise proceed directly to question 7			
5.	How many times **per week, on average**, have you used chat tools?		1 2-3 4-5 6 or more
6.	What was the purposes for your use of WebCT chat in this course? Please rank the choices from 1 to 4, where 1 is the most frequent use and 4 is the least frequent use.		____Recreation/Entertainment ____School/Work related ____Research ____Other (please specify_

7. What were the positive outcomes you gained using WebCT Discussions in this course?
8. What were the positive outcomes you gained using WebCT Chat in this course?
9. What were the challenges/difficulties using WebCT Discussions in this course?
10. What were the challenges/difficulties using WebCT Chat in this course?
11. Did you utilize any other electronic discussions tools for this course?