An Analysis of the Effectiveness of Collaborative Activities and Enforced Due Dates in an

Online Class

By

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ABSTRACT

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Educational institutions are making increasingly heavy commitments to Internet-based or
online classes. One of the major problems with courses in this format is that course retention
rates are typically significantly lower than the live or in-class versions of the course. Prior to
focusing on this aspect of online course development, the presenter routinely experienced 50 to
60 percent drop rates in online courses while experiencing only ten to fifteen percent drop rates
in the live versions of the same course. The content of the courses was exactly the same, the
only real difference being the format.

A quasi-experimental research project was undertaken. During the spring semester of
2000, an Internet version of the course, Introduction to Programming using Visual Basic was
offered. The only interaction the students had during the course was an optional introductory
meeting and the ability to contact the instructor via email. Thirty students started the course and
seventeen finished with a grade of C or better resulting in a 43 percent drop rate. During the

summer semester of 2000, the same course was offered. 24 students registered for the course and eighteen finished with a grade of C or better resulting in a 25 percent drop rate.

The following changes were made to the format of the summer session course. A moderated text chat room was made available to students at least twice a week on different times and different days. A voice chat room was made available to students on a regular basis as well. A threaded discussion was available to students for posting questions and comments. A discussion list was set up for students to be able to email all members of the course expeditiously. Pictures, biographies and email addresses of all students were made available on the course web site. The instructor was available in an open lab environment three times during the course of the semester. Learning pace was controlled through the strict enforcement of due dates. Assignments were also made interactive with several creative formats introduced.

Following the summer session, a survey was sent out designed to measure the attitudes of the students following the course. Summer session participants felt connected to the course, to the instructor and to other class members while spring students felt isolated and less connected. The inclusion of activities designed to create a learning community and control learning pace appears to have influenced course retention.

Table of Contents

List of Tables

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Chapter 1

Introduction

The Growth of Online Course Offerings

Online course offerings, those courses that are taught over the Internet, by two and four year higher education institutions continue to increase in number at a dramatic rate. According to a National Center for Education Statistics report (NCES 2000-013), all but nine percent of public two-year and four-year institutions plan to offer distance education courses in the next three years. In addition, total enrollment in distance education courses across all post-secondary degree-granting institutions approximately doubled from 1995 to 1997-98, from 754,000 to 1.6 million. The tremendous growth has brought to the forefront issues that need to be addressed.

For many students, online courses afford them with educational opportunities that might not otherwise be available. According to Dr. Sylvia Charp, editor in chief of T.H.E. Journal, typical distance learners are those who do not have access to programs, employees who work during class hours, homebound individuals, and those who are unable or unwilling to attend traditional classes (Charp, 2000).

An article in the Chronicle of Higher Education traces the experience of Anna Spalding, a veteran distance education student who has completed 75% of her college courses through distance education. Spalding states, "I really think that distance education is a great opportunity for someone who has either a tough professional schedule or a tough personal schedule to continue their education" (Carr, 2000, p. A40).

<u>Problems with Distance Learning Courses</u>

The challenge for colleges and universities who offer distance education courses becomes retaining the students who enroll in them. An article in the Chronicle of Higher Education (Carr, 2000) reports that no national statistics exist yet about how many students who start distance education courses actually complete them. Anecdotal evidence and studies done by individual institutions suggest that the retention rates are generally lower in distance education courses than in their traditional counterparts. There is significant variation among institutions reporting figures but most administrators generally agree that, "course completion rates are often 10-20 percentage points higher in traditional courses than in distance offerings" (Carr, 2000, p. A39). Michele Tolela-Myers, President of Sarah Lawrence College believes something is missing in the current formula for many distance education courses. "If education were only as simple as reading, then libraries would have replaced schools long ago" (Tolela-Myers, 2000, A25).

There are two primary practices that can dramatically affect the effectiveness of distance learning courses. One factor involves the creation of courses that effectively use the tools of the Internet to create a collaborative community of learners (Cooper, 2000). Computer mediated communication principles can augment the information being presented and make the student feel more "connected" to the course. The other factor is the enforcement or control of the pace of student learning (Zhang, 1998). Enforcing assignment due dates and being deliberate about when new material is released can have a large impact on student success

<u>Learning Communities</u>

There are several ways to initiate the learning community. According to Linda Cooper (2000) there must be regular instructor to student interaction, student to instructor interaction and

finally, student-to-student interaction. In an online environment, the way to accomplish this is through the use of various forms of computer-mediated communication.

There are several ways to communicate interactively via the computer. One of the most common is email. Email can be used for one-on-one communication between all involved parties. Through the use of a discussion list, it can also be used as an effective group communication tool. Zhang (1998) indicates that discussion lists are very effective tools for immediate communication of information. They provide a very fast and efficient way for an instructor to communicate to an entire community. If a course has a web site, information can certainly be posted there, but because email has become more of a way of life, students are more likely to check their email than they are a web site.

Another form of computer-mediated communication is a threaded discussion (also called a bulletin board or conference). A threaded discussion provides a "point of evaluation through analysis of the types of questions posed, the types of responses given, the depth of the observations between teacher and student and student and student" (Wade, 1999, p. 97). It also can be a means by which students collaborate. Cartwright indicates that in her use of a threaded discussion, "Students became resources for each other around technology problem solving, support systems developed, and students learned from each other by sharing resources and experiences" (Cartwright, 2000, p. 89). They collaborated and they learned.

Chat rooms provide synchronous communication in a distance environment. The software FirstClass is a course management system that brings several computer-mediated communication tools under one umbrella. Duquesne University uses FirstClass and makes extensive use of its chat environment. According to the article ("Duquesne university gears up", 1999), students use the chat feature to log in on particular days at particular times to interact with

classmates and instructors. Like other forms of computer-mediated communication, students appreciate the flexibility of being able to log on from almost anywhere to participate in the collaborative activities.

Controlled Learning Pace

Leasure, Davis, and Thievon (2000) indicate that students who choose to enroll in traditional classes versus online classes do so primarily because they want increased interaction and they want to limit their ability to procrastinate. The study points out that those online learners that are best suited to the environment are those that are self-directed and can avoid procrastination.

The reality, as indicated above, is that some students have no option other than distance learning. One way to help make them successful is to control the learning pace. A student's success in the course will be increased by enforcing assignment due dates and controlling the release of material. This keeps the group of students together and limits their ability to procrastinate (Zhang, 1998).

Statement of the Problem

The purpose of this study is to determine the effectiveness of introducing selected collaborative activities and controlled learning pace into online courses.

According to Western Wisconsin Technical College's (WWTC) web site (http://www.western.tec.wi.us), it is a two-year public college located in LaCrosse, Wisconsin. WWTC is an associate degree granting institution that offers coursework in 63 program areas and serves approximately 3,500 full-time-equivalent students with a full-time faculty of approximately 200. The college serves a rather diverse student population within about 70 miles of the LaCrosse area.

The courses being studied were offered at Western Wisconsin Technical College during the spring semester of 2000 to approximately 35 students and in the summer of 2000 to 25 students. During the spring semester, collaborative activities and controlled learning pace were not part of the course. During the summer, many attempts were made at collaborative activities and learning pace was controlled through the strict enforcement of due dates.

Registration and course completion information was obtained from the registrar at Western Wisconsin Technical College for both time periods to assess course retention levels and learner outcomes in the form of grading information. In addition, a survey was developed and completed by students who participated in the course to determine if attitudes regarding the course are affected by collaboration and control of learning pace.

Through the analysis of the data from the coursework and the survey, the answers to the following questions were sought.

Research Questions

1. To what extent is course retention impacted by the incorporation of collaborative activities and controlled learning pace into an online class?

2. To what extent student achievement impacted by the incorporation of collaborative activities and controlled learning pace into an online class?

3. Are attitudes regarding the course affected by the incorporation of collaborative activities and controlled learning pace into an online class?

4. Which course material best contributes to student success and positive attitudes in an online course?

<u>Null Hypotheses</u>

1. The retention rate with regard to students staying in an online course will not be impacted by the incorporation of collaborative activities and controlled learning pace.

2. Student Achievement in online classes will not be impacted by the incorporation of collaborative activities and controlled learning pace.

3. Attitudes of students regarding online learning will not be impacted by the incorporation of collaborative activities and controlled learning pace.

4. Students who participated in courses where collaborative activities were incorporated will not consider those aspects of the course more important than those who did not participate in courses with those activities.

5. Students who participated in courses where the learning pace was controlled will not consider that aspect of the course more important than those who did not participate in courses with that component.

6. Students who participated in courses where collaborative activities were incorporated and learning pace was controlled will not consider those elements of the course more important than instructor interaction and course resources.

Significance of the Problem

1. Western Wisconsin Technical College, like many other institutions trying to institute online learning programs, has a problem with retention in online courses. Some courses are experiencing a 40 to 60 percent drop rate. That is simply unacceptable and must change in order for the college to continue efforts in that mode of delivery.

2. "Community, where people join in small groups to discuss, explore and learn together, has existed for centuries as a central concept of learning" ("The powerful potential of learning communities", 1999, p. 1). In the institutional rush to create online courses this seems to have been forgotten. One of the reasons for this is that according to Ahern and El-Hindi (2000) the transition from a lecture oriented classroom to one that values "collaborative discourse" is not an easy matter. The results of this study may provide some transitional information for online educators.

3. Online learning is a relatively new educational arena. Techniques and practices are still being developed and perfected. The application of classroom techniques are being translated to online environments. The research can act as a change agent in the delivery and methodology for the practices surrounding delivery of online courses at Western Wisconsin Technical College.

4. The research has practical application in the design and delivery of other online courses.

Definition of Terms

Asynchronous communication is "an instructional approach that does not require students and instructor to be in the same place at the same time, or even available during a specified time" (Cartwright, 1994). Examples of this include, threaded discussions, conferences, bulletin boards, electronic mail and discussion lists.

Chat rooms are, according to Clauson (1998), used to provide a live or synchronous communication environment. The medium can include text, audio and video.

Computer-mediated communication is fostered by "software designed to support the collaborative, multivoiced, reciprocal interaction of a small group discussion" (Ahern & El-Hindi, 2000, p. 385)

Distance Education is the "linking of a teacher and students in several geographic locations via technology that allows for interaction" (Cartwright, 1994).

Discussion List software, like ListServ, according to Zhang (1998) allows for the immediate broadcast of email to all subscribers in a given list.

An online class is a course that is delivered primarily over the Internet.

Synchronous Communication is a medium in "which students and instructor meet at the same time but not in the same place and communicate with each other electronically" (Cartwright, 1994). Examples of this include chat rooms.

Threaded Discussion/Bulletin Board/Conference software provides a medium in which:

A question or proposition is posted and the student is expected to respond to that question. Once a response is posted, it is filed away by student name and is dated. The next student may respond to the original proposition or the student posting. All students

can read and post comments. This continuous growing of ideas only stops when the students feel the proposition is exhausted (Wade, 1999, p. 97).

Limitations of the Study

1. One reason that "traditional" online students take online courses is due to extenuating circumstances in their lives. Some students will perform poorly and/or drop a course irrespective of the delivery method due to those circumstances.

2. Relative to the entire student population at Western Wisconsin Technical College, online students are still a fairly small percentage. The sampling of students is thus rather limited.

3. In reality, two independent variables were modified, collaborative activities and controlled learning pace. This study does not attempt to determine the impact of either of those variables autonomously.

Unknowns

1. The students who registered for these courses took them knowing they were Internet based courses but random selection cannot be guaranteed.

2. The spring session was sixteen weeks long. The summer session was eight weeks long. The same information was presented to each group but the duration of the course may affect outcomes.

3. There may be inherent differences in students who register for a course in the spring versus the summer.

4. I enclosed a quarter with the survey. The quarter serves as a token and an illustration in the cover letter but the fact that participants were "paid" might impact their responses.

Chapter 2

Review of Literature

Background

The purpose of this literature review is to provide background information on the incorporation of collaborative activities and controlled learning pace into an online course. There is a significant amount of research on both of these topics. In many instances, the concept of collaborative activities is incorporated under the umbrella of the creation of a learning community. In essence, collaborative activities foster learning communities, thus the research is directed in that manner. Enforcement of due dates and controlled learning pace imply structure, thus structure is the theme in that realm.

Learning Communities

According to Rodrigues (1999), the interaction between the learner and the learning material as well as the social interaction between two or more people are considered necessary for learning. Further, Bertram (1999) reports that students graduating from a university often describe the opportunities to learn from other students and informal learning opportunities derived from being part of the university environment to be even more important than their formal coursework. "Without a sense of community, of common interest and action, there is no class" (Knox, 1997). Michelle Tolela-Myers, President of Sarah Lawrence College believes that if the sole goal of a university is to transmit information then all classes could be held in a large lecture hall, the number of students in a class would be limitless and a single lecturer could serve hundreds of students. Translate that thought to the Internet and the numbers potentially multiply exponentially. She clearly believes that teaching is more than that. Teachers do more than

transmit information, "We educators are in the business of forming minds - not just filling them" (Tolela-Myers, 2000, A25). Creating an interactive environment in a face-to-face class, while a challenge, is at least made easier by the fact that the students are in the same room and can see each other. To create an interactive environment in an online class an effort needs to be made to create an online learning community.

According to Shrivastava (1999), learning communities are groups of people engaged in collaborative activities. They are characterized by bringing together those who seek to enhance their personal knowledge and apply that knowledge in a work-related environment. Interaction and mutual learning among group members define learning communities. In the past, the only real way to make this happen was to use it in the context of face-to-face discussions in a traditional classroom. The rising popularity of the Internet makes it very possible to create this atmosphere beyond a classroom or university and expand it regionally, nationally and even globally (Shrivastava, 1999). To create learning communities at a distance, Internet communication resources like bulletin boards, chat rooms, individual email and listservs must be used.

According to Peterman (2000), the online classroom encourages a depth of sharing and interaction that is often not possible in a traditional face-to-face classroom. Mulligan and Geary (1999) report that instructors who teach online typically get to know their students better and understand the depths of their opinions. This happens primarily because students who generally won't speak up in a face-to-face classroom feel more freedom (or are forced by an assignment) to express an opinion in an online environment. Knox (1997) reports that creating a virtual course is about creating a community of scholars among a group of people who will never see one another. The lack of a physical classroom creates some special challenges but also creates some

special opportunities. Electronic communities do flourish on the Net. People form bonds extremely quickly, and e-mail has a particular intimacy not found in a room full of chairs and desks.

In a study completed by Barry Fisherman (1999) on the use of computer-mediated communication, email was seen as a primary tool for students to communicate with the instructor, other students and outside experts. Email can be used for one-on-one communication. Through the use of a discussion list or listserv, it can also be used as an effective group communication tool. Zhang (1998) indicates that discussion lists are very effective tools for immediate communication of information. They provide a very fast and efficient means for an instructor to communicate to an entire population. If a course has a web site, information can certainly be posted there, but because email has become more of a way of life, students are more likely to check their email than they are a web site. "The real teaching and learning goes on in discussion, and my listserv is the life-blood of my courses" (Knox, 1997). Zhang (1998) also indicates that in his study, student use of the discussion list was minimal and usually provided irrelevant information. He determined that the reason for this was that there were no specific assignments involving the discussion list. If computer-mediated communication isn't assigned, students generally won't use it. This essentially means that the incorporation of community building communication activities must be built into the pedagogy of the online course.

Bulletin boards (also called threaded discussions and conferences) provide a very effective mode of communication. Teachers use these to create class discussions. According to Peterman (1999), response to the conference threads by faculty helped them to guide student discussion and interaction. The conference boards effectively replaced the classroom discussion. Rodrigues (1999) reports that in many ways the use of conferences added an element of

academic rigor to online classes. A tremendous amount of detail accumulated in the conference board. Maintaining an overall view of all topics was demanding for both the students and the instructor. In addition, Teh (1999) comments that the conferences start out completely empty. They develop as students and instructors post comments, present opinions and express ideas. They also provide a way to document sources of additional information (like links to other web pages).

Email, listservs and conferences are modes of asynchronous communication. What this means is that students don't have to be online at the same to work with one another. These methods of communication are not time dependent, in other words, they don't go away (Bertram, 1999). This provides a couple of advantages. One is that students who take online courses are typically taking them due in part to scheduling challenges. According to Peterman (2000), students typically use late evening hours (after the kids are in bed) and weekends to complete the work. Duin (1998) reports that the use of the asynchronous forums free learners from having to work at the same time and thus makes it easier for them to communicate at a distance.

The second advantage asynchronous communication can provide is that using online communication tools implies better responses from students. "During the online sessions, students comments were richer, fuller and more reflective because they had opportunities to deliberately phrase and actively construct their response" (Rodrigues, 1999, p. 266). During face-to-face sessions student comments are typically off-the-cuff, immediate and primarily reactive. This fosters an environment where only the loudest get heard and it in no way affords the student who needs to reflect an opportunity to do so prior to responding. Students also were prone to prompting from the person leading the discussion, which can serve to limit free thought (Rodrigues, 1999). Rodrigues goes on to say that in a typical face-to-face classroom, the teacher

tends to dominate the environment. This goes against the idea that Bertram (1999) discusses when students describe informal learning experiences and interaction with other students to be more important to learning than the formal learning activities.

The other realm of computer-mediated communication includes synchronous activities, those that require all students to be online at the same time. These activities typically manifest themselves in the form of chat rooms. Instructors can hold chats to answer questions real-time. Sometimes something more personal than email is required from instructors. Under certain circumstances a telephone conversation or face-to-face meeting may be necessary as well (Peterman, 1999). Instructors can hold chats that bring students together as well as open the possibility to invite expert "guests" to participate in the chat (Shrivastava, 1999). It is a lot easier to ask a guest to log in to a chat for an hour than it is to have the guest come to campus and participate in a lecture.

The evidence above suggests that while course content and learning activities in an online course are implied, the deliberate creation of learning communities using online communication tools turns mere content into an interactive course. Therefore, one component of a successful online learning environment is the creation of a community of learners. The other component that this paper focuses on is the creation of a organized structure for the class. This manifests itself in a couple of ways, primarily through the enforcement of assignment due dates and the control of learning pace.

<u>Controlled Learning Pace</u>

Roblyer (1999) indicates that students who have been found to have difficulties structuring their time and managing the demands of coursework may be more likely to drop classes, achieve poor scores and be less than satisfied with their distance learning experience.

Further, Snell and Mekies (1999) report that online courses may involve students who register late and find that online courses are the only ones available. Also, students entering online classes may believe that they are easier and require less work because they don't have to attend class. "Once they begin to procrastinate, they fall behind and never catch up. Thus, they fail or withdraw" (Snell & Mekies, 1999, p. 195).

Leasure, Davis, and Thievon (2000) conducted a study of nursing students taking a nursing research course. As part of the course they solicited comments from students taking the Internet course. Some of the more compelling comments in this regard include, "I don't think I have the discipline for an Internet class", and "I procrastinate and therefore would not do the Internet assignments until the last minute" (Leasure, Davis, & Thievon, 2000, p. 152). In the latter comment, were due dates not given or enforced, the student may not have completed the assignments at all and would have been forced to drop the course. The course used a weekly timeline and assignments were due on a weekly basis.

In his history class, Knox offers further comments on the need for structure,

The unstructured, webbed nature of the class had another effect. By having no clear schedule or agenda, I had atomized the class. The students did not tell me this explicitly, but I understood it from their messages. Since everyone could read any of the material at any time, we had no common basis for discussion. And without that, we literally had no class; we were instead separate individuals who would separately earn three credits of history and who might by accident have something to say to one another (Knox, 1997).

To solve the problem, he created a class schedule and required his students to follow it.

Zhang (1998) offers four principles for successful distance learning experiences. One of them is control of learning pace. He comments that many distance education students have significant scheduling challenges. These students are helped considerably by essentially having someone tell them what to do and when to do it. He broadens the definition to indicate that the instructor must be willing to control or at least comment on the effort students are putting into the course. Zhang believes that the best learning is learner centered and he admits that strict control implies less of a student controlled environment. To him, the control issue is so imperative that he is willing to forgo that notion in this regard.

Knox (1997) offers yet another spin on this. In his initial incarnation of the class he put all of the material out on his web site and instructed the students to work on what they wanted to whenever they wanted to. He refers to that Latin word for educate, "educare" which translated means to lead out or lead toward. By putting a web site up that offered no direction to the students he felt that he had sorely neglected his responsibility to lead the class. What he thought he created was a flexible learning environment. What he wound up creating was a web site that demanded undivided attention. A student would comment on one subject and all of the others felt compelled to drop whatever they were working on, read the material relative to the comment, and comment on it. After this happened several times, many students simply became overwhelmed with the process and gave up.

Mulligan and Geary (1999) write about the requirements of their online writing course. Several attempts at building structure into the class are documented. They put students into groups and required them to participate in discussions and projects with other students. The instructor also gave the students guidelines for responding to the readings. Among other things, the guidelines encouraged the students to respond thoughtfully instead of hurriedly. There were

also requirements that involved posting a minimum number of messages every week. "In almost all cases, the students followed the guidelines and engaged other students in thoughtful dialog" (Mulligan and Geary, 1999, p. 390).

Peterman (2000) discusses the timing of due dates. They found that because distance learners used the weekend to get things done, Sunday night was a very common timeframe for assignment due dates. Rodrigues (1999) indicates that in her class, which was a combination of an online class and a face-to-face class, the online requirement was that students read two journal articles per week and contributed to the conference forum once per week. Duin (1998) reports that her institution entered the online realm very cautiously and asked her to carefully document nearly everything she did. They university wouldn't approve the course in the online format until the documentation was complete. One of the components of the class was a strict deadline for assignments of Saturday night.

The review indicates that the fostering of learning communities through computer-mediated communication and the control of a course are essential elements in a distance-learning environment. Knox (1997) comments that so many things in the traditional classroom, like due dates, student interaction and implied leadership, are taken for granted. The online instructor needs to remember to translate those components that are so obvious in a face-to-face class to the online environment.

Chapter 3

Methodology

The purpose of this study was to determine the effectiveness of the introduction of selected collaborative activities and controlled learning pace into an online class. The following section will give a detailed account of the participants involved in the study, the instrument that was used, the data collection techniques and a description of how the data was analyzed.

Participants

The participants in this study were students who took online classes at Western Wisconsin Technical College (WWTC) in LaCrosse, Wisconsin. The classes being studied were online sections of Introduction to Programming (course number 107114) and Windows Based Programming (107190) offered during the spring 2000 and summer 2000 sessions. The Introduction to Programming course is required in all computer and information systems degree programs at WWTC. The Windows Based Programming course is required for students in the programmer/analyst program and is many times taken as an elective in other programs. Students were enrolled during each session from a variety of associate degree programs and an attempt to analyze data from all students will be made.

Instruments

To determine retention data, official registration information was obtained from the registrar at WWTC. That information included the number of students who enrolled for the course and the number who completed it. In addition, performance data in the form of a grading average for each student was obtained from the instructor for the course.

The participants were surveyed using an instrument developed by the researcher. The survey attempted to determine attitudes of the effectiveness of course activities in six general topic areas: student interaction, instructor interaction, collaborative activities, resources provided by the instructor, controlled pace of the course activities, and overall feelings about the course. Zhang (1998) offers basic principles regarding the effectiveness of online courses. Two of his primary principles are the effective use of collaborative activities and enforced or controlled learning pace (enforced assignment due dates). In addition, Cooper (2000) indicates that in order to establish a community in an online course, there must be regular instructor to student interaction, student to instructor interaction and student-to-student interaction. The instrument was designed to determine if the enforced interactions were meaningful. Responses were measured using a five-point Likert scale that included the responses strongly disagree, disagree, neutral, agree, strongly agree. The mean and standard deviation will be reported for each result. The instrument was pilot-tested by a group of people that include the researcher's investigation advisor, two instructors at Western Wisconsin Technical College with expertise in online learning and two students. Given the time constraints with regard to completion of the paper, the reliability of the instrument was not determined.

<div align="center">Procedures</div>

This design of this study is quasi-experimental in that participants were manipulated on the independent variable of the incorporation of collaborative activities and controlled learning pace into an online course. Data obtained from the registrar was used to determine the course retention rate and student achievement. In addition, the research is descriptive in that it uses a mailed survey to determine the feelings and attitudes of the participants about the course.

During the spring semester of 2000, 30 students were enrolled in one section of an online class facilitated by the researcher. The only interaction was instructor to student and student to instructor via email. No other communication methods were used. In addition, during this time period learning pace was not controlled, i.e. due dates for assignments were not enforced.

During the summer session of 2000, 24 students were enrolled in two sections of an online course facilitated by the researcher. During this time period, there was student to instructor and instructor to student interaction. This interaction included various forms of computer-mediated communication like significant amounts of email, time spent in chat rooms, the use of a discussion list and the use of a threaded discussion. In addition, as a component of selected assignments for the course students were directed to email each other, invoking student-to-student interaction. Other collaborative or community building activities were also added. A discussion list was set up giving each student the ability to email a question to the whole class. A chat room was incorporated into the course and students were given the opportunity to regularly interact directly with other students and the instructor. A "Communicate" web page was established that listed the email address for each student in the class as well as a short biography and a picture. Finally, learning pace was controlled through the strict enforcement of due dates.

To determine attitudes and feelings about the course, participants were surveyed using a instrument developed by the researcher. Prior to mailing the survey, participants were emailed to inform them of its impending arrival (Appendix A is a copy of the email letter that was sent). The survey (Appendix C is a copy of the survey) was mailed to each participant along with a cover letter (Appendix B is a copy of the cover letter), a self-addressed stamped envelope, and a 1999 state quarter as an incentive to complete the survey. The survey was not anonymous

though confidentiality was guaranteed and the names of the participants were pre-printed at the top of the instrument. The survey was mailed on October 10, 2000 with a request to have it returned by October 21, 2000. During that time span, follow-up phone calls and emails to non-respondents were made at regular intervals to insure an appropriate rate of response.

Chapter 4

Results

The purpose of this study was to determine the extent to which collaborative activities and controlled learning pace impacted course retention, learner outcomes and general feelings about the course. There were two groups studied in the survey. One group (Spring) took an online class at Western Wisconsin Technical College during the spring semester of 2000. This group had no collaborative activities and due dates were not enforced. Another group (Summer) took an online class at Western Wisconsin Technical College during the summer session of 2000. This group had many opportunities for collaboration and learning pace was strictly controlled.

<u>Hypotheses One - Null form</u>

The retention rate with regard to students staying in an online course will not be impacted by the incorporation of collaborative activities and controlled learning pace.

According to registration records at Western Wisconsin Technical College, the Spring group originally had 30 registrations. By the end of the course, 17 students remained, with the balance being those students who dropped, withdrew, or failed the course due to a lack of participation. This accounts for a 56 percent rate of course retention. The Summer group originally had 24 registrations. By the end of the course, 18 students remained, with the balance being those students who dropped, withdrew, or failed the course due to a lack of participation. This accounts for a 75 percent rate of course retention.

Table 1

<u>Course Retention Rate</u>

	Registered for Course	Remained in Course	Did not complete Course	Course Retention Percentage
Spring	30	17	13	56%
Summer	24	18	6	75%

Based upon the data presented, course retention was impacted by the incorporation of due dates and collaborative activities. However, the probability, based on a Chi Square, is 0.132 and insignificant, thus the null hypothesis is accepted.

<u>Hypothesis Two - Null Form</u>

Student Achievement in online classes will not be impacted by the incorporation of collaborative activities and controlled learning pace.

Table 2

<u>Student Achievement, Assignment and Test Average</u>

	Mean Course Average	Standard Deviation
Spring	88.56	4.60
Summer	94.24	3.63

Both classes had exactly the same number of assignments and only slight differences in the assignments themselves. The test questions used for both classes were the same. The average reported was the mean average for the course when grading information for assignments, tests and other activities were considered. The mean average for the Summer group was higher. The probability for the grade average, based on a T-Test was 0.0001 and significant, thus the null hypothesis is rejected.

<u>Survey Instrument</u>

A survey instrument was mailed to course participants in the Spring and Summer groups. 17 surveys were mailed and 16 surveys were returned making the rate of response 94 percent for the Spring group. 18 surveys were mailed and 17 surveys were returned making the rate of response 94 percent for the Summer group. A total of 35 surveys were mailed and 33 surveys were returned making the rate of response 94 percent. Questions and mean scores for each question by group are reported in the table that follows.

Table 3

Survey Results

		Mean Spring	SD Spring	Mean Summer	SD Summer	F	P
1.	During this course the instructor was available to me for questions	4.31	0.87	3.76	0.97	2.894	.099
2.	Assignments were graded and posted by the instructor in a timely manner	3.76	0.97	3.65	0.93	2.470	.126
3.	Timely grading and feedback on assignments was important to my success in this course	4.00	1.15	3.88	0.99	0.099	.755
4.	I used other students in the class as a resource when I had questions or problems	1.94	1.12	3.24	1.25	9.782	.004
5.	Having other students look at my programs was effective in helping me better understand the course material	1.81	0.91	3.24	0.97	18.182	.0001
6.	Joining other students in the chat room was effective in helping me better understand the course material	1.94	1.06	2.94	0.90	8.615	.006
7.	Emailing the instructor was helpful to me	4.50	0.73	4.06	0.97	2.168	.151
8.	Emailing other students was helpful to me	2.25	1.13	3.41	1.12	8.816	.006
9.	Chat sessions were helpful to me	2.25	0.93	3.00	0.87	5.749	.023
10.	The web page effectively communicated (with regard to assignments and daily activities) what I needed to know to complete the course	4.69	0.48	4.76	0.44	0.234	.632
11.	The lecture notes were effective	4.63	0.50	4.59	0.51	0.044	.835
12.	The audio lectures were effective	3.31	0.95	3.29	0.77	0.004	.952
13.	The sample programs and algorithms were effective	4.19	0.83	4.29	0.47	0.208	.652
14.	Enforcement of due dates helped me	3.75	1.39	4.18	0.73	1.240	.274
15.	I paced myself well through this course	3.50	1.32	4.00	0.61	1.996	.168
16.	Procrastination is something I struggle with	3.88	1.26	3.29	1.26	1.750	.196
17.	I liked this class	4.75	0.45	4.41	0.71	2.629	.115
18.	I feel I learned as much from this class as I would have were the class delivered in a more traditional format	3.69	1.58	4.00	0.87	0.505	.483
19.	I would take another online course	4.38	1.02	4.41	0.71	0.014	.905
20.	I felt this course was a successful experience for me	4.37	0.89	4.47	0.72	0.117	.735

The survey was broken down into sections each consisting of three or four questions.

Table 4

Survey Results by Section

Section	Mean Spring	SD Spring	Mean Summer	SD Summer	F	P
Instructor Interaction Questions 1, 2, 3	4.15	0.63	3.76	0.72	2.580	0.118
Student-to-Student Interaction Questions 4, 5, 6	1.90	0.92	3.14	0.85	16.142	0.001
Collaborative Activities Questions 7, 8, 9	3.00	0.78	3.49	0.77	3.285	0.080
Course Resources Questions 10, 11, 12, 13	4.20	0.42	4.24	0.31	0.063	0.804
Pace Questions 14, 15, 16	3.71	0.62	3.82	0.50	0.347	0.560
General Feelings Questions 17, 18, 19	4.30	0.89	4.32	0.62	0.010	0.921

<u>Hypothesis Three - Null Form</u>

Attitudes of students regarding online learning will not be impacted by the incorporation of collaborative activities and controlled learning pace.

The general feelings section of the survey measured the overall attitudes of each group regarding the course.

Table 5

<u>Survey Results, General Feelings about Course</u>

	Mean	SD
Spring	4.30	0.89
Summer	4.32	0.62

Overall the feelings of the Summer group were slightly better than those of the Spring group. The probability, based on an ANOVA was 0.921 and insignificant, thus the null hypothesis is accepted.

Hypothesis Four - Null Form

Students who participated in courses where collaborative activities were incorporated will not consider those aspects of the course more important than those who did not participate in courses with those activities.

Two sections of the survey dealt with collaborative activities.

Table 6

Survey Results, Sections on Collaboration

Section	Mean Spring	SD Spring	Mean Summer	SD Summer	F	P
Student-to-Student Interaction - Questions 4, 5, 6	1.90	0.92	3.14	0.85	16.142	.0001
Collaborative Activities - Questions 7, 8, 9	3.00	0.78	3.49	0.77	3.285	.080

The mean score for the Summer group was slightly better than those of the Spring group. The probability, based on an ANOVA was 0.0001 for student-to-student interaction and 0.080 for collaborative activities. Significant data was determined for these sections of the survey and thus the null hypothesis is rejected.

<u>Hypothesis Five - Null Form</u>

Students who participated in courses where the learning pace was controlled will not

consider that aspect of the course more important than those who did not participate in courses

with that component.

The section of the survey on learning pace measured this.

Table 7

<u>Survey Results, Attitudes about Learning Pace</u>

Section	Spring Mean	Spring SD	Summer Mean	Summer SD	F	P
Controlled Learning Pace questions 14, 15, 16	3.70	0.62	3.82	0.50	0.063	.560

The mean score for the Summer group was slightly higher than for the Spring group. The

probability, based on an ANOVA, is 0.804 and insignificant, thus the null hypothesis is accepted.

Hypothesis six - Null Form

Students who participated in courses where collaborative activities were incorporated and learning pace was controlled will not consider those elements of the course more critical to their success than instructor interaction and course resources.

Table 8

Survey Results, Element Most Critical to Success

Activity	Spring	Percent	Summer	Percent
Instructor Interaction	7	43.8	7	41.2
Student to Student Interaction	0	0	0	0
Collaborative Activities	1	6.3	1	5.9
Course Resources	7	43.8	9	52.9
Controlled Learning Pace	1	6.3	0	0

The results for both groups were very similar. The probability based on the Pearson R is 0.748 and insignificant, thus the null hypothesis is accepted.

Chapter 5

Summary, Conclusions and Recommendations

This final chapter is divided into three distinct sections. It begins with a summary section, which reviews the entire study. The second section reports the conclusions that can be drawn from the analysis of the survey data. The final section will discuss both recommendations related to this study, and recommendations for future studies.

Restatement of the Problem

The purpose of this study is to determine the effectiveness of introducing selected collaborative activities and controlled learning pace into online courses.

Methods and Procedures

A quasi-experimental research project was undertaken to determine the effect of incorporating collaborative activities and controlled learning pace into online courses as Western Wisconsin Technical College in LaCrosse, Wisconsin. During the spring semester of 2000, an online course called Introduction to Programming was taught. For the duration of the class, a web site was available that directed learning. The students could contact the instructor, but no other interactive activities were planned for the course. No due dates were established for the assignments and students were encouraged to work at their own pace. During the summer session of 2000, the same course was offered. The web site and all assignments were virtually the same. Students were given access to a discussion list and encouraged to email the list for help. Individual email addresses for students were also published and they were encouraged to contact each other. Students were put in to groups and forced (by assignment) to work together. Due dates were established for all assignments and they were strictly enforced. In October of

2000, a survey (see appendix C for a copy of the survey) that measured feelings and attitudes about the course was mailed to all participants in each course who received a grade of C or above. The survey had 21 questions, and the first twenty questions were broken down into six categories, Instructor Interaction, Student-to-Student Interaction, Collaborative Activities, Course Resources, Pace, and General Feelings. The final question on the survey asked the participants to rate which of the six categories was most critical to their success.

Major Findings

Data was collected for this survey in two realms, data from the registrar at Western Wisconsin Technical College and from class participants through means of a survey. The data from the registrar reported that 44% of the students who registered for the Spring course dropped or failed the course and 25% of the students in the Summer course dropped or failed it. Further, the mean grading average for the students in the Summer course was six points higher than the Spring course. This suggests that the manipulations, namely the creation of learning communities and controlled learning pace did have an affect on course retention and student achievement.

The survey data was less conclusive in that the responses for both groups were fairly similar. There were two sections that dealt with the creation of learning communities, the sections on Student to Student Interaction and Collaborative Activities. Students in the Summer group were more favorable toward those activities than students in the Spring group. The expectation was that the Summer group would be more favorable toward activities regarding controlled learning pace as well, and they were not, which was surprising. On the other hand, not very many students are terribly introspective about what it takes for them to be successful in

learning. It may have been difficult for them to really consider the idea that learning

communities and controlled learning pace were elements essential to their success.

Both groups considered Instructor Interaction and Course Resources to be the

components most critical to their success. The expectation was that the Summer group would

consider those activities less important that the Spring group because of the creation of learning

communities and controlled learning pace. The reality is that Instructor Interaction and

Controlled Learning Pace are two elements that are paramount to the success in the class, so

naturally they would be ranked highest between both groups. It would have been more

interesting to have the students rank the activities in order of importance or left Instructor

Interaction and Course Resources out of the list. More significant data might have been obtained

in either case.

<div align="center">Conclusions</div>

<div align="center">Research Question 1</div>

Research question one read, "To what extent is course retention impacted by the

incorporation of collaborative activities and controlled learning pace into an online class?"

The study looked specifically at course retention data. 44% of the students in the spring

group, where there were no collaborative activities and no controlled learning pace, dropped the

course. 25% of the students in the summer group, which included collaborative activities and

controlled learning pace dropped the course. The summer group retained about 19% more

students. The Chi Square test (p=0.132) showed no significance on these. Given more cases and

similar percentages the probability becomes significant. Even though there isn't true statistical

significance, the trend certainly suggests that course retention was impacted favorably by the incorporation of collaborative activities and controlled learning pace.

Research Question 2

Research question two read, "To what extent is student achievement impacted by the incorporation of collaborative activities and controlled learning pace into an online class?"

Learner outcomes and student achievement were measured basically on the numeric grading average at the end of the class. The mean average for the spring group was 88.56 and for the summer group was 94.23. The T-Test ($p = 0.0001$) resulted in a very high rate of significance. The mean average for the students in the summer group was six percentage points higher than in the spring group. Given that six percentage points is represents close to an entire letter grade higher on the instructor's grading scale (93-100, A / 84 - 92, B / 76 - 83, C) it's fair to say that student achievement is significantly impacted by the introduction of collaborative activities and controlled learning pace.

Research Question 3

Research question 3 reads, "Are attitudes regarding the course affected by the incorporation of collaborative activities and controlled learning pace into an online class?"

The first twenty questions on the survey were measured using a five point Leikert scale where 1 is strongly disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is strongly agree. The questions were broken down into three categories labeled, Instructor Interaction, Student to Student Interaction, Collaborative Activities, Course Resources, Pace and General Feelings. Statistics were generated on each question and a composite score for each section was also determined. On five of the questions, and two of the categories, significant statistical

significance was determined. The table below illustrates the statistically significant questions.

Table 9

Survey Results, Questions with Statistical Significance

		Mean Spring	SD Spring	Mean Summer	SD Summer	F	P
4.	I used other students in the class as a resource when I had questions or problems	1.94	1.12	3.24	1.25	9.782	.004
5.	Having other students look at my programs was effective in helping me better understand the course material	1.81	0.91	3.24	0.97	18.182	.0001
6.	Joining other students in the chat room was effective in helping me better understand the course material	1.94	1.06	2.94	0.90	8.615	.006
7.	Emailing the instructor was helpful to me	4.50	0.73	4.06	0.97	2.168	.151
8.	Emailing other students was helpful to me	2.25	1.13	3.41	1.12	8.816	.006
9.	Chat sessions were helpful to me	2.25	0.93	3.00	0.87	5.749	.023

The table below illustrates the statistically significant category sections.

Table 10

Survey Results, Sections with Statistical Significance

Section	Mean Spring	SD Spring	Mean Summer	SD Summer	F	P
Student-to-Student Interaction - Questions 4, 5, 6	1.90	0.92	3.14	0.85	16.142	.0001
Collaborative Activities - Questions 7, 8, 9	3.00	0.78	3.49	0.77	3.285	.080

In the survey, these were the only points that had any measure of statistical significance.

The results on the other fourteen questions were very similar between both groups of students.

One of the main themes of this study revolved around the creation of learning communities. The

six questions listed above and the two category sections speak directly to that theme. Of the six questions, the only one that didn't show statistical significance was question seven, "Emailing the instructor was helpful to me." This was initially surprising but upon reflection, the instructor was the only avenue the spring students had for assistance. Assuming the instructor did an adequate job, this number naturally should have been the same for both groups of students.

The questions that dealt with controlled learning pace (questions 14, 15 and 16) elicited very similar responses, (M=3.70 for the Spring group and M=3.82 for the Summer group). What might have influenced this is the idea that it may difficult for either group to articulate that controlled learning pace was important to their success. Many students take an Internet class because of the flexibility it affords and the romantic notion of being able to do the work when desired. The practical reality is that most people need a deadline or goal to work towards, otherwise it's simply too easy to procrastinate. Further, not very many students are terribly introspective about what it takes for them to be successful in learning. It may have been difficult for them to really consider the idea that learning communities and controlled learning pace were essential elements to their success.

Specifically with regard to the research question listed above, based on the results of the survey, the answer would have to be that overall student attitudes are not significantly impacted by the creation of learning communities and controlled learning pace. However, attitudes specifically regarding learning communities are considered more favorable among those students who participated in them.

Research Question 4

Research question four reads, " Which course material best contributes to student success and positive attitudes in an online course?"

For this question the survey listed each of the six survey categories and the student was asked to mark the one category that they considered most important to their success. The numbers were almost exactly the same for both groups and the results were basically a tie between instructor interaction and course resources. The expectation was that the numbers would be a little bit stronger for learning community and controlled learning pace activities. In reality, given that the student could only choose one response, it was natural for them to have chosen either the course resources or instructor interaction. Instructor Interaction and Course Resources are two activities that the students absolutely need to complete the course. The Summer group is the one that participated in the learning community activities and controlled learning pace. It would seem natural for them to perhaps have responded differently based on the class activities. On the other hand, the data might suggest that the manipulation was so unobtrusive that the summer class didn't really even notice it. It would have been interesting to have the students rank the activities in order of importance or have left Instructor Interaction and Course Resources out of the list. More significant data might have been obtained in either case.

Based upon the data, it appears that instructor interaction and course resources are most important to students. One can draw the further conclusion that continued growth in those areas will contribute to more positive attitudes about the class.

<u>Recommendations</u>

The hard data regarding course retention rate and student achievement suggests that those students in classes where learning communities were fostered and learning pace was controlled did better than students in classes where those activities were not incorporated into the class. It seems logical to continue growth in those two areas.

The students in these classes considered instructor interaction and course resources most important to their success. That indicates that instructors who teach this class online (generalization is plausible, but the scope of this study doesn't warrant it) should continue to focus on creating better and more comprehensive course resources. Students are also looking for a high degree of interaction with the instructor as it relates to response to questions and the grading of assignments. The instructor then is compelled to pay attention to these aspects of the course.

<u>Recommendations for Further Study</u>

This study only dealt with those students who completed the course. A significant percentage, 44% of the Spring class and 25% of the Summer class, dropped the course. It would be interesting to survey those who dropped the course to find out why they dropped.

This study manipulated two distinct variables, the creation of learning communities and controlled learning pace. The conclusions don't indicate whether one or the other was more important. It would be interesting to have someone repeat a similar study and only manipulate one of the variables.

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<u>Appendix A</u>

<u>Email to students regarding the mailing of the survey</u>

To: (name)
CC: (none)
Subject: Help your former instructor, Scott Finn

Hello (name):

My name is Scott Finn and I was your instructor for the online course you recently took. Currently I am in the process of completing my master's degree at the University of Wisconsin-Stout and I need your help to complete a research paper.

In the next day or two, you will receive a survey from me in the mail that asks 20 questions regarding the online course. It comes with an addressed, stamped envelope. Please fill it out and mail it back to me as quickly as possible so I can continue my project. I estimate it will take you no more than ten minutes to complete the survey.

Thank you in advance for your cooperation.

Scott Finn
CIS Instructor
Western Wisconsin Technical College

Appendix B

Cover letter that was sent with the survey

October 10, 2000

Student Name
Address
City State Zip

Dear Student:

My name is Scott Finn and I was your instructor for the online programming course you recently took. Currently I am in the process of completing my master's degree at the University of Wisconsin-Stout and I need your help to complete a research paper. I am asking you to take this survey because my research deals with issues surrounding online courses. Since you finished one within the last six months, you are a perfect candidate for taking the survey

In this envelope you will find four things:

- This letter
- A copy of the survey. There are twenty questions and I estimate that it will take you no more than ten minutes to fill it out.
- An addressed, stamped envelope. I wanted to make it as easy as possible for you to complete and return this survey.
- A quarter. This isn't just any quarter; it's a Connecticut state quarter. These were released in 1999 and will never be released again. They are somewhat common now but perhaps if you hang on to it, it will become rare . . .

You will find that the survey is not anonymous because your name is preprinted at the top. I did this **only** so I could follow up with those of you who choose not to respond as quickly as others. I think you will find the questions pretty straight-forward and non-threatening. The purpose for my work is that I truly appreciate the concept of online learning. I want to get better at it and my hope is that this research will help me. Even though the survey is not anonymous, it is confidential in that your identity will not even come close to my paper. The report deals with the data at a group as opposed to an individual level. The bottom line is that the survey is not anonymous but it is confidential.

My timeline for getting this paper done is rather tight and I have done all that I can do until I get your information. I would ask that you return this survey to me no later than October 21 so I can proceed with my research. When the paper is complete, I will put it on my web site. Read it if you're curious. Look for an email sometime later this fall for the URL.

Thank you in advance for your cooperation.
Scott Finn

<u>Appendix C</u>

<u>Survey that was sent to class participants</u>

Name: (pre-printed)   Course: (pre-printed)

Consent to Participate in the Study
I understand that by returning this questionnaire, I am giving my informed consent as a participating volunteer in this study. I understand the basic nature of the study and agree that any potential risks to my privacy are exceedingly small. I also understand that there are potential benefits that might be realized from the completion of this study. I am aware that the information is being sought so that the researcher knows my name and corresponding responses. I understand that in the report of the data gathered, my responses will be held strictly confidential and my name will not be reported. I realize that I have the right to refuse to participate and that my right to withdraw from participation at any time during the study will be respected with no coercion or prejudice.

Note: Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher (Scott Finn, phone (507) 895-2058) and second to Dr. Ted Knous, Chair, UW-Stout Institutional Review Board for the protection of Human Subjects in research, 11 HH, UW-Stout, Menomonee, WI, 54751, phone (715) 232-1126.

Instructions for Completing the Survey
The following survey relates to the activities related to an online course that you took at Western Wisconsin Technical College facilitated by Scott Finn. Please read each statement carefully and indicate by circling your response how much you agree or disagree with it based upon the following scale:

SD = Strongly Disagree   D = Disagree   N = Neutral   A = Agree   SA = Strongly Agree

Instructor Interaction

1. During this course the instructor was available to me for questions   SD   D   N   A   SA

2. Assignments were graded and posted by the instructor in a timely manner   SD   D   N   A   SA

3. Timely grading and feedback on assignments was important to my success in this course   SD   D   N   A   SA

Student-to-Student Interaction

4. I used other students in the class as a resource when I had questions or problems   SD   D   N   A   SA

5. Having other students look at my programs was effective in helping me better understand the course material   SD   D   N   A   SA

6. Joining other students in the chat room was effective in helping me better understand the course material   SD   D   N   A   SA

Collaborative Activities

7. Emailing the instructor was helpful to me   SD   D   N   A   SA

8. Emailing other students was helpful to me   SD   D   N   A   SA

9. Chat sessions were helpful to me   SD   D   N   A   SA

Continued on back

Course Resources

10. The web page effectively communicated (with regard to assignments and   SD   D   N   A   SA
    daily activities) what I needed to know to complete the course

11. The lecture notes were effective   SD   D   N   A   SA

12. The audio lectures were effective   SD   D   N   A   SA

13. The sample programs and algorithms were effective   SD   D   N   A   SA

Pace

14. Enforcement of due dates helped me   SD   D   N   A   SA

15. I paced myself well through this course   SD   D   N   A   SA

16. Procrastination is something I struggle with   SD   D   N   A   SA

General Feelings about the course

17. I liked this class   SD   D   N   A   SA

18. I feel I learned as much from this class as I would have were the class   SD   D   N   A   SA
    delivered in a more traditional format

19. I would take another online course   SD   D   N   A   SA

20. I felt this course was a successful experience for me   SD   D   N   A   SA

21. This survey measured your feelings in five distinct areas; instructor interaction, student-to-student
    interaction, collaborative activities, course resources and pace. Of these five activities, which do you think
    is most critical to your success in an online course?

Place an X next to the ONE activity you deem most critical:

_____   Instructor Interaction

_____   Student-to-Student Interaction

_____   Collaborative Activities

_____   Course Resources

_____   Pace

Thank you for your time and thoughts