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I am submitting herewith a dissertation written by Michael North entitled "Examining the Experiences of Students Engaged in Online Study." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration.

Norma T. Mertz, Major Professor

We have read this dissertation and recommend its acceptance:

Vincent Anfara, Grady Bogue, John Lounsbury

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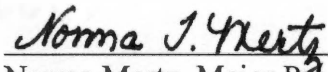
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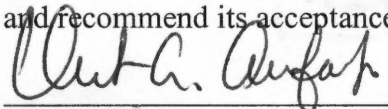
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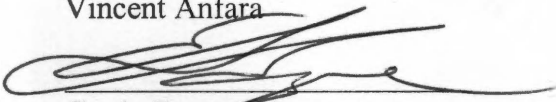
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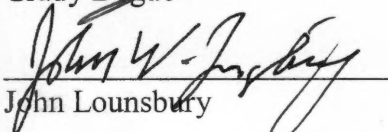
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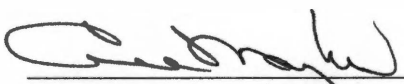
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Graduate Studies

Thesis
2005b
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Examining the Experiences of Students Engaged in Online Study

**A Dissertation
Presented for the
Doctor of Education Degree
The University of Tennessee, Knoxville**

**Michael North
August, 2005**

DEDICATION

This dissertation is dedicated to my parents

Gary and Marty North

and

My wife
Cynthia McCleary-North

additionally

my dogs, Bud and Missy, who spent many nights and mornings at my feet. You will
always be remembered.

From Michigan State to now, you have all supported me in your own way and made this
possible. Thank you and I love you all very much.

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The completion of this dissertation would not have been possible if not for the support of a variety of individuals. To all of you, my life has been made better by getting to know you for, as time passes, this brief period of time spent obtaining this degree. I would specifically like to thank Dr. Jeff Aper, Dr. Grady Bogue, Dr. John Lounsbury, and Dr. Vincent Anfara for their guidance. My thanks also go to the Department of Educational Administration and Cultural Studies. And a special thank you goes to my major professor, Dr. Norma Mertz, who guided me throughout this project.

I also extend my warmest thanks to my cohort group (1998-2000). The support I found among you was extremely beneficial and will continue to reward me with your friendship in the future. I would also like to thank the numerous individuals at Pellissippi State Technical Community College who gave me encouragement and guidance. Your help from my decision to continue my education has made the completion of this dissertation and degree possible. I am forever grateful.

To my mother, thank you for long evenings teaching me how to write and read. To my father, thank you for your courage to achieve everything you have done, as it has inspired me to do the same. To my wife, you have supported me, loved me, comforted me, and tolerated me throughout this entire experience. I am forever in your debt. And to someone who inspired me whether you knew it or not, the present conundrum will never overshadow the epiphany we had long ago.

And to any doctoral student who happens to read this page, here's something for you when you feel like quitting:

Self-Pity

I never saw a wild thing
sorry for itself.

A small bird will drop frozen dead from a bough
without ever having felt sorry for itself.

D. H. Lawrence

ABSTRACT

The purpose of the study was to compare the experiences of ten community college students enrolled in either the online version or traditional lecture-discussion version of a mathematics course taught by the same teacher. Six participants were enrolled in the online section and four participants were enrolled in the traditional, lecture-discussion section.

A qualitative approach relying heavily on phenomenology served as the primary focus for data collection and analysis. Semi-structured, open-ended interviews were conducted with each participant at different points in the semester. Additionally, journals were maintained by each participant about their experiences in the course. The data were analyzed inductively to derive the themes that characterized the experience of each group and the group themes were then compared.

The themes that characterized the experience of the students that studied online were: 1) Need for Flexibility; 2) Self-Discipline; 3) Good Feel to the Course; and 4) Social Connection with Fellow Students. The themes that characterized the experience of the students enrolled in the lecture-discussion section were: 1) Preference for a Structured Learning Environment; 2) Good Feel to the Course; and 3) Social Connection with Fellow Students. In comparing their experiences, both groups had a good, positive feel about the course and developed a social connection with their respective classmates. Also, the groups differed in the manner each preferred to approach working on the course.

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term</u>
AA	Associate of Arts degree
AS	Associate of Science degree
OL	Online
LD	Lecture-Discussion
MATH-1010	Course Title: Fundamentals of Mathematics
PSTCC	Pellissippi State Technical Community College
SCCI	Sense of Classroom Community Index

CHAPTER I

INTRODUCTION

While there are various, complex issues facing higher education in the 21st century, few have more implications for how instruction will be delivered than online study.

Although online study has a number of staunch critics (Clark, 1994; Hansen, Maushak, Schlosser, Anderson, Sorensen and Simonson, 1997; Noble, 1997; Phipps, Wellman, and Merisotis, 1998; Phipps & Merisotis, 1999; Postman, 1990), online learning has become an established option college students have for pursuing their educational goals.

Based on the rapid and continuing growth of the Internet (d'Hermillon, Jr., 1999; Dolence, 1998; Donahue; 2001; Greene, 1999; Read, 2000; SREB report, 1999), and the investment higher education has made in online technology, online study is expected to continue to grow. In Table 1-1, data gathered for a 1998 National Center for Education Statistics study on distance learning indicated that institutions were not only aware of online study's potential for enrollment growth, but they were planning for it by increasing their use of Internet-based technology. Also, as demonstrated in Table 1-2, the percentage of institutions that employed Internet based technologies had nearly tripled from 1995 to 1997.

Additional evidence indicates that the growth of online study is well underway. For example, Greene (1999) found that, while only 22% percent of the colleges and universities surveyed in 1995 were utilizing the Internet, 60% percent were doing so by 1997. The Southern Regional Education Board's "Electronic Campus" began in

Table 1-1

Percentage distribution of 2-year and 4-year postsecondary education institutions that offered distance education in 1997-98 or that planned to offer distance education in the next 3 years according to their plans for the next 3 years concerning the number of distance education courses that will be offered, by type of technology that will be used as the primary mode of instructional delivery.

Technology	Reduce	Keep Same	Increase	No Plan
Two-way video with two-way audio (interactive)	1	4	61	34
One-way video with two-way audio	1	3	17	79
One-way live video	1	1	14	84
One-way prerecorded video	1	11	35	54
Two-way audio	**	2	9	88
One-way audio	1	1	9	89
Synchronous internet courses	**	1	60	39
Asynchronous internet courses	0	1	82	16
CD-ROM	0	1	31	69
Multi-mode packages **	1	30	69	0
Other technologies	**	**	3	96

**Less than 0.5 percent

NOTE: Percentages are based on the estimated 2,580 institutions that either offered distance education courses in 1997-98 (1680 institutions), or that planned to offer distance education courses in the next 3 years and could report about their technology plans (900 institutions). Zeros appear in the table when no institution in the sample gave the indicated response.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick Information System, Survey on Distance Education at Postsecondary Education Institutions, 1998-1999.

Table 1-2

Percentage of 2-year and 4-year institutions offering distance education courses that used various types of technologies to deliver distance education courses in 1995 and 1997-98.

Technology	1995*	1997-98**
Two-way video with two-way audio	57	56
One-way video with two-way audio	24	14
One-way live video	9	6
One-way prerecorded video	52	48
Audiographics	3	n/a
Two-way audio transmission	11	5
One-way audio transmission	10	5
Synchronous internet courses	n/a	19
Asynchronous internet courses	n/a	60
Other computer-based technology	22	n/a
CD-ROM	n/a	7
Multi-mode packages	n/a	8
Other technologies	5	2

*Based on the estimated 1,130 higher education institutions that offered distance education course in fall, 1995.

**Based on the estimated 1590 higher education institutions that offered any distance education courses in 1997-98.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Postsecondary Education Quick information System, Survey on Distance Education Courses offered by Higher Education Institutions, 1995, and Survey on Distance Education at Postsecondary Education Institutions, 1998-1999.

1998 with 104 courses. Currently, it offers nearly 2000 courses and more than 75 degree programs online (SREB, 1999). More recently, Illinois Virtual Campus, a collaborative effort between the University of Illinois and the Illinois Board of Higher Education, reported a 44 percent enrollment increase in distance learning programs with online courses being the most popular option (Donahue, 2001).

Among the numerous examples of the growth of online study, perhaps the most notable is the University of Phoenix. Claiming to be the “nation’s largest private university,” the University of Phoenix offers both undergraduate and graduate programs and highlights some of the implications of change that online study has for higher education.

Higher education’s enthusiasm for this most recent addition to distance learning finds support in the research and literature on online learning. Research on the performance of online students supports the notion that students who study online perform at a level greater than or equal to that of their classroom counterparts (Barker, 1994; Despain, 1997; Russell, 1999; Stinson & Claus, 2000). Similarly, some research satisfaction among online learners suggests that online and classroom environments are the same and that little or no differences exist between the experiences of online students and those in traditional courses (Biner, 1997; Gunawarda & Zittle, 1997; Schutte, 1996; Ward, 1998; Wegerif, 1998).

However, while these findings serve to strengthen the argument for the continued growth of online study, the extant research leaves the question of the comparability between online and classroom study unanswered. While studies of student performance have consistently shown students earn comparable grades in both environments (Barker,

1994; Cheng, Lehman, & Armstrong, 1991; Despain, 1997; Dutton, Dutton & Perry, 1999; Gubernick & Eberling, 1997; Lander, 1999; Maki, Maki, Patterson & Whitaker, 2000; Mesher, 1999; Morrissey, 1998; Navarro & Shoemaker, 1999; Redding & Rotzien, 1999; Russell, 1999), this does not address other areas worthy of research. The grade a student achieves is merely one data point about the student's experience and at best, a limited one. It says little about what the student encountered during the course, problems they experienced, sources of stress, and other data points that may impact the experience of studying online.

Moreover, the research on student satisfaction is anything but monolithic. Wegerif (1998), for example, found that while the majority of his subjects were satisfied with their experiences, a small number reported a high level of dissatisfaction with online study. Based on in-depth, post-course interviews, he concluded they had failed to have a "threshold" experience that permitted them to embrace studying online. Data have also emerged from a small yet growing body of research involving the Internet and online study that raises questions about the comparability of experiences for online and traditional students. Feenberg (1987) found that students reported experiencing general anxiety with communicating online. Brown and Liedholm (1996), Abrahamson (1998), and Rahm and Reed (1998), all reported isolation to be a problem for online students. While Hara and Kling (2000) did not find isolation to be a concern, they reported that students experienced higher anxiety levels when they encountered technical problems during their online sessions. And, contrary to the prevailing research, Cheng, Lehman, Armstrong (1991) found less positive attitudes toward the learning environment among online participants studying Spanish as compared to their lecture-discussion counterparts, as did Despain

(1997) with students who also studied Spanish online. Examining business management students, Morrissey (1998) reported that while the online group outperformed the traditional classroom group, online students indicated lower levels of satisfaction and cohesion. Similarly, Maki, Make, Patterson, and Whittaker (2000) found that while online students in an introductory psychology course had greater content mastery than did lecture-discussion students in the same course, the satisfaction level of the online group was substantially lower.

Further, recent research about Internet usage challenges the assumption that online and classroom learning environments are the same and raise additional questions about the effects and efficacy of online study. While not dealing strictly with college students, a study of Internet use conducted by Stanford University's Institute for the Quantitative Study of Society (SIQSS) of 4113 adults showed a decline in involvement in social activities outside the home as Internet use increased (O'Toole, 2000). Similarly, the HOMENET project, an ongoing study at Carnegie Mellon University's Human-Computer Interaction Institute provided 93 families in the Pittsburgh area with a computer and an Internet account. Interview data suggested that family members classified as "high Internet use" individuals, regardless of different factors under examination, reported less social engagement, and were found to have higher rates of depression and poorer overall psychological well-being than individuals who utilized the internet less frequently (Biemiller, 1998, p. 1).

Clearly, the findings of research regarding performance and satisfaction are mixed and raise questions about the comparability of the online and classroom experience. Of equal concern is that the majority of studies of online learning have utilized post-course

surveys or post-course interviews with participants regarding their experiences as the methodological approach to the research. In other words, they give a limited view of the experiences, one that does not provide a clear sense of what one encounters during the experience itself. To remedy this, a study that examines what it is like for students as they engage in comparable online and in-class courses is needed to add perspective to the limited methodological view and to begin to reconcile differences in the literature about the experience.

Statement of the Problem

Online study is clearly growing, and more and more institutions are moving to offer online courses and programs. Based on research involving the performance of online students and their levels of satisfaction with online instruction, it is likely that this trend will continue. While this research has contributed to the assumption that the experiences of online students and traditional, in-class students is basically the same, a growing body of research is raising questions about the comparability of the online and in-class experiences. Given the significant amount of resources that are being dedicated to the development of online study, the confidence expressed about the comparability of the experiences and the limits of that research, there is a need to more fully and systematically examine the experiences of online student and traditional students.

Purpose of the Study

The purpose of this study is to compare the experiences of community college students studying mathematics online and in a traditional classroom setting.

Research Questions

The research questions guiding this study were:

- What are the experiences of community college students in an online mathematics course?
- What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?
- How do the experiences of community college students in the online mathematics course compare with those in the traditional, in-class mathematics course?

Significance

By developing a broader, richer description of the experiences of online and traditional, in-class students, this study contributed toward resolving some of the limitations of existing research concerning student experiences with online study and its' comparability to traditional study. Further, it provided critical information to administrators in higher education as well as policy makers that will allow them to make more informed decisions about how to best assist online students and whether and to what extent they may wish to allocate resources to online study. Relatedly, this study will provide valuable information to faculty who teach or seek to teach online about student perspectives on their experiences that can help them be more effective teachers online.

Delimitations & Limitations

The study was delimited to students at a single community college in one course. The results, therefore, may not apply to the experiences online students have at other institutions or in other courses.

In order to probe deeply into the experiences of online students, an in-depth, qualitative research design was adopted. Consequently, breadth was sacrificed in order to achieve depth. While the findings may be suggestive, they are applicable to the students examined and may not apply to other students at the institution or other institutions.

Definition of Terms

The following terms have been utilized throughout this study and, for clarity, are defined as follows:

Distance Learning – the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance (source: The United States Distance Learning Association)

Online Learning – the act of studying via a computer and Internet connection

Social Presence – in a computer-mediated environment, the degree to which a person is perceived as a “real” person in communication

Virtual University – institutions that offer most or all of their instruction via technological means and are distinguished by their use of technology as the educational delivery device

Organization of the Study

The study is organized into five chapters. In Chapter One, an introduction to the study, a statement of the problem, the purpose and questions that guided the study, study delimitations and limitations, definitions, and organization of the study are presented. A

review of the research relevant to the study is presented in Chapter Two. In Chapter Three, the methods and procedures used in the conduct of the study are detailed. The results of the study are presented in Chapter Four. Finally, Chapter Five offers a review of the study and its findings, a discussion of findings, conclusions, and recommendations for further research.

CHAPTER II

REVIEW OF RELATED LITERATURE

Overview

The purpose of this study was to compare the experiences of community college students studying mathematics online and in a traditional classroom setting. This chapter examines the literature relevant to the study and is organized into three sections. In the first section, "Performance Studies," studies that have compared the performance of online students to traditional ones are reviewed. "Satisfaction Studies," the second section, provides an examination of research about student satisfaction with online study. In the third section, "Student Experience with Online Study," research about experiences with online study is discussed.

Performance Studies

The majority of studies comparing the performance of students in online and lecture-discussion courses were conducted in the 1990s, and used grades or test scores as the performance measure. These studies continue to be used to demonstrate the efficacy, if not superiority, of online study. Further, they continue to be used to support the expansion of online study, since they have shown that online students tend to outperform their peers in lecture-discussion courses (Barker, 1994; Cheng, Lehman, & Armstrong, 1991; Despain, 1997; Dutton, Dutton & Perry, 1999; Gubernick & Eberling, 1997; Lander, 1999; Maki, Maki, Patterson, Whitaker, 2000; Mesher, 1999; Morrissey, 1998; Navarro & Shoemaker, 1999; Redding & Rotzien, 1999; Russell, 1999; Schutte, 1996).

As is typical of such studies, Barker (1994) examined the differences in final exam scores between online students and traditional students in a variety of unmatched online and classroom-based college courses. Although the number of students involved was not specified, Barker reported statistically significant differences between the two groups, with the online students achieving higher grades than traditional students. Additionally, based on course evaluations from the students, Barker claimed that the more interaction the online students had with their instructor and other students, the more likely they were to achieve a passing grade in the online course (1994).

While his sample size was small, Schutte (1996) found that online students scored an average of 20% higher than their counterparts studying in a traditional classroom. Schutte worked with 33 undergraduates enrolled in a social statistics course at California State University, Northridge. Prior to the beginning of the term, the group was randomly assigned into either the online or classroom section and data were gathered regarding participants' age, sex, class rank, ethnicity, GPA, hours worked per week, and attitudes toward computers and statistics. No noticeable differences were found among the two groups with regard to the data collected. After the 14 week course, during which the traditional students met each Saturday for a five-hour session and the online section held weekly, online discussions in which everyone participated, Schutte examined the mid-term and final exam scores of the online and lecture-discussion groups. Of a possible 100 points on the midterm exam, the online students earned a higher mean score (72.31) than the traditional group (54.76). On the final exam, the online students once again had a higher mean score (81.56) than the traditional study group (61.35). Both the higher midterm

average score and the higher final exam score for the online students were significant at the .001 level.

To explain the higher scores achieved by the online students, Schutte assessed specific conditions for both groups of students regarding their attitudes and perceptions about math, the contact they had with fellow students throughout the course, time devoted to the course, perception of flexibility, and understanding of course material. As may be seen in Table 2-1, at varying levels of significance, he found the virtual students had higher mean scores in each of these areas (Schutte, 1996, p. 4). While the online students had to spend more time to complete the work, they interacted more frequently with other students, the instructor, and the course material. Combined, Schutte claimed this contributed to their outperforming the section of traditional students (1996).

Lander (1999) reported similar findings. While not stating a specific number of study participants, Lander compared the grades of college students enrolled in an online

Table 2-1

Mean scores and significance levels for conditions of online and traditional study groups

Variable	Online	Traditional	Significance
Attitude toward Math	6.81	4.76	($P < .033$)
Student Contact	7.25	5.17	($P < .039$)
Time Spent on Class	9.00	6.94	($P < .010$)
Perception of Flexibility	6.43	4.87	($P < .087$)
Understanding of Material	6.06	4.76	($P < .092$)

and traditional psychology course. Like Barker (1994), Lander found that students in the online course achieved grades that were higher than those achieved by students in the traditional course. Based on follow up interviews he conducted with study participants, he concluded that the higher grades among online students were a result of their perceived ability to interact more frequently with other students as well as the instructor. According to Lander (1999), "the collaborative and interactive exercises presented to the online course contributed to producing an improved retention of course material and higher grades in the online class" (p. 2).

Despain (1997) had comparable results when he researched undergraduates enrolled in a beginning Spanish class. Of the 80 students with whom he worked, 40 were randomly assigned to an online section of the course. These participants were instructed to work with an online version of exercises that consisted of software designed to administer listening comprehension exercises and tests. The other 40 students were assigned to lecture-discussion sections, where the same listening comprehension exercises were administered by the instructor.

Despain found significant differences between the two student groups in two of his three hypotheses with regard to performance. First, he hypothesized that the online students would perform significantly higher on a learning achievement test administered after the completion of all listening comprehension exercises. Although the online group did achieve a higher mean score (53.56) than the traditional group's mean score (50.52), it was not significant at the .05 level. It was also hypothesized that there would be a significant and positive correlation between the amount of time spent on successfully practicing the listening comprehension exercises and performance on a series of practice

tests given prior to the completion of listening exercises. For this hypothesis, the mean of the online group (54.39) was higher than the traditional group's mean score (49.65). This difference was significant at the .01 level. A positive correlation for the online group (.597) and the traditional group (.516) between successful practice and achievement was also reported. The higher correlation was determined to be significant at the .01 level. Finally, Despain hypothesized that a significant, positive correlation would be present between the number of repeated exercises and performance on the practice tests administered during the study. For this hypothesis, a positive correlation for the online group (.560) and the traditional group (.280) was reported to be significant at the .01 level. To account for higher scores and correlations of the online group, Despain claimed that online students outperformed their lecture-discussion counterparts based on a "time advantage" (1997). In post-course interviews with participants, the online students described this advantage as a perceived capacity to more frequently access and repeat the language skill exercises that were included in the course software.

Morrissey (1998) examined the differences in the performance of 208 executive MBA students in a management education course. Of the 208 students, 104 were assigned to use a "groupware" software package that allowed them to meet and work on the course online. The other half did not receive the software and met in a traditional classroom. Evaluating examination scores to compare the two groups of participants, Morrissey reported that the online students achieved higher grades than their traditional counterparts.

Dutton, Dutton, and Perry (1999) studied the differences in performance of an online and face-to-face offering of an introductory course in C++ programming at North Carolina State University. Of the 272 who completed the final examination, 141 comprised the

online group while the remaining 171 were students enrolled in the lecture-discussion sections. Final examination scores were compared after the course concluded and the mean score for the online group (73.5) was nearly 10 points higher than the lecture-discussion group (63.9), and the difference was significant at the .05 level.

Labeling online participants in their study “cyberlearners,” Navarro and Shoemaker (2000) studied 200 graduate economics students at the University of California – Irvine. The 49 students who selected the online option were found to score higher than the 151 students who enrolled in the traditional classroom sections on their final exams. Comparing the online and lecture-discussion final examination scores, the researchers found that the mean exam score for a 15-question final exam for online students was 11.3 while the mean score for traditional students was 9.8, statistically significant at the 99% level.

Maki, Maki, Patterson, and Whittaker (2000) had similar results with students in an online and in-class introductory psychology course. Comparisons of course grades between the online and lecture-discussion sections revealed that not only did online students outperform their lecture-discussion counterparts, but their mastery of the course content was higher based on their final exam scores. Maki, Maki, Patterson and Whittaker suggested that the greater content mastery among the online students had to do with the instructor’s requirement that they interact more frequently with the course material and not because of “any inherent advantage of the online medium” (2000). For example, one aspect of the online course was the requirement for the online students to make weekly e-

mail reports to the instructor once they had finished their course review exercises. In post-course interviews, students reported that this was a positive feature that aided their performance.

Overall, these studies have lent support to the move to establish online study as a viable option for college students. However, while the results of these studies are positive, they are hardly definitive. One of the concerns is that not all of the studies reported a sample size for their study groups. Although different types of online and traditional classes are noted (Lander, 1999; Maki, Maki, Patterson, & Whittaker, 2000; Redding & Rotzien, 1999), the specific number of students with which each researcher worked is unknown. As a result, the generalizability of these studies comes into question.

A number of the performance studies attribute the higher academic performance of online students to factors that are not inherent to online study, e.g., greater interaction with the instructor. The affect of such variables has not been teased out of studies of academic performance. This confounds the conclusions that can reasonably be drawn about online study from performance studies. Exam scores and grades appear as the primary means of claiming that online study is not only successful, but beneficial to students. However, while higher exam scores translate well into “selling” online study to the public, we still do not know enough about what online students experience throughout the process of completing their coursework to be able to make such claims. An exam score or grade serves as only one point of data.

An excellent example of this need to study more than performance appeared as early as 1991 in research conducted by Cheng, Lehman, and Armstrong at Indiana University. Their study was set up in a similar way to many performance studies, however, it included

other elements as well. Working with 53 students in a graduate level course that provided an overview of computing applications for education, the researchers assigned 25 students to an on-campus class and the other 28 to an online section. After gathering pre-study data to assure similarity between the two study groups, participants were then evaluated on their achievement level in two course examinations, the amount of time necessary to complete tasks related to the course, and their attitudes toward the method by which the course was delivered. Based on exam results and a survey after the course was completed, the average exam score was slightly higher for the lecture-discussion group (92.75 versus 91.48 for the online group), and the online students spent a greater amount of time on the class (7.15 hours per week) than the lecture-discussion students (5.36 hours). With regard to student attitudes toward the course, the mean score was lower for the online group (45.23) as opposed to the lecture-discussion group (49.41), and was statistically significant at the .05 level (1991). Additionally, the researchers also tracked the completion rate of the two student groups and reported that 32% of the online students failed to complete the course while only 4% of the on-campus, lecture-discussion students did not finish.

What is both interesting and revealing about the focus on performance is that it has persisted even though there have been calls to more fully explore student attitudes toward studying online as well as to examine the amount of time necessary to complete online courses. Indeed, Cheng, Lehman, and Armstrong (1991) called for more detailed examination into these two areas as well as what might have produced the higher incompleteness rate for the online group.

While comparing the performance of online and traditional students has been necessary to establish the effectiveness of the online study environment, there has been a

concomitant assumption that the online environment has been the causal factor in producing the superior performance of online students. In other words, a connection between higher performance and the online environment has been posited that may not be accurate. The University of Phoenix, for example, was not hesitant about making it known that its' 1997 graduates scored an average of 5% to 10% higher on different standardized achievement tests than graduates from three public universities in Arizona (Gubernick & Ebeling, 1997) as a result of their taking courses online. It is not clear that the claim was backed by empirical research. The impression left, however, was that the medium itself was responsible for the superior achievement of their students. It may or may not have been the case.

This concern has not gone unnoticed by researchers who have reviewed studies of the performance of online students. Analyses of the research literature have concluded that little more than a causal link between higher grades and online learning existed (Clark, 1994; Hansen, Maushak, Schlosser, Anderson, Sorenson, Simonson, 1997; Phipps & Merisotis, 1998; Phipps, Wellman, & Merisotis, 1998). Hansen, Maushak, Schlosser, Anderson, Sorenson, and Simonson (1997) simply labeled the bulk of studies that have examined online student performance "inappropriate." In their own study, Maki, Maki, Patterson, and Whittaker (2000) recognized this and suggested that the higher grades obtained by the online students in their study were largely due to "forcing them to interact with course material and not due to any inherent advantage of the web-based format" (p. 237). As a means of improving what is known about online study, each analysis has called for additional inquiry to learn more about why online students tend to outperform students in traditional settings.

A recent study conducted at Michigan State University addressed this issue directly. Brown and Liedholm (2002) examined the test scores of students enrolled in an undergraduate microeconomics course. The researchers studied 363 students from “live” economics sections that met three times a week, 258 students from a “hybrid” course that substituted two of the three sessions with online exercises and interactive teaching materials, and 89 students from two “virtual” course sections that were held entirely online. The students in the virtual sections had comprehensive ACT scores that were significantly higher than both the live and hybrid sections, and had also completed more credit hours toward graduation. Comparing the three study groups, statistical analysis revealed a significant difference between the live and virtual teaching methods. The researchers found that the virtual sections outperformed the other two sections with regard to the more basic parts of the course such as simple definitions and identification of concepts of microeconomics. However, the virtual group’s performance declined as material was introduced that required them to make more complex applications of economic concepts. Contrary to the performance literature that had previously emerged favoring online study, Brown and Leidholm suggested that based on the virtual group’s lower performance with more challenging exercises, an online format for teaching advanced concepts in economics might be inferior to the traditional, face-to-face method of teaching undergraduates who are beginning to study the subject.

While performance studies have demonstrated that online students can perform at levels that exceed students in traditional classrooms, the limitations of these studies, in terms of using small numbers of subjects, non-comparable groups and post-course measures of performance, raise questions about the applicability of their results.

Further, the emphasis on performance tells us nothing about student attitudes toward online study or what online students experience during their coursework. Without such information, it is not possible to determine whether learning online and learning in the classroom are comparable.

Satisfaction Studies

Similar to performance studies, satisfaction studies have been seen as a means of supporting the efficacy of online learning. Different ratings of online coursework, such as overall impressions of a course and instructor, amount of interaction between students, amount of interaction between students and the instructor, and student perceptions of support from the instructor as well as technical support, have been grouped under the term “satisfaction” and used as a means of assessing what students think of online study. Assessment of student satisfaction with online study has also been a part of a number of performance studies that compared the online setting with the traditional classroom setting (Cheng, Lehman, & Armstrong, 1991; Despain, 1997; Gunawardena & Zittle, 1997; Johnson, Aragon, Shaik, & Palma-Rivas, 2000; Maki, Maki, Patterson, & Whitaker, 2000; Morrissey, 1998; Schutte, 1996; Wegner, Holloway, and Garton, 1999).

When student satisfaction is the focal point rather than performance, the assertion that online study is comparable or superior to the classroom is less certain. While studies of performance have demonstrated that online students can achieve higher grades than lecture-discussion students, studies of student satisfaction have yielded both positive and negative results with respect to satisfaction, leaving the question of the comparability of the online and traditional classroom open.

Schutte (1996), who examined the performance of 17 online and 16 traditional students enrolled in a college statistics course, also gathered data about online and traditional student satisfaction with their class. In post-course surveys, Schutte found that when compared to the traditional student group, the online group reported a “higher perceived contact” among fellow students and the professor that resulted in higher satisfaction ratings for the online section.

Similarly, Gunawardena and Zittle (1997) hypothesized that student satisfaction with online coursework would occur as a result of what they termed “social presence.” The researchers operationalized social presence as the “feeling” or “sense” an online student had of being with other students and the instructor while online. They examined post-course data collected after administering a 61-item survey given to 50 graduate students from five different institutions who, as a part of their coursework, participated in an online conference. Survey data revealed a correlation of .775 between social presence and student satisfaction with online study.

Wegner, Holloway, and Garton (1999) also found that online students were highly satisfied with their coursework. At the conclusion of two semesters, 17 graduate education students enrolled in a traditional setting and 14 graduate students enrolled online in the same course, were given a satisfaction survey. Post-course survey data from online students indicated higher levels of satisfaction with the course than students in the classroom section. Based on a 5-point Likert scale (1=Strongly Agree, 2=Agree, 3=No Opinion, 4=Disagree, 5=Strongly Disagree), the online group had higher average ratings of satisfaction with the overall quality of the course (1.2) as opposed to the traditional group (1.8). The online participants also had a higher average rating for the intellectual challenge

of the course (1.15 versus 1.45) and the instructor's organization (1.64 versus 2.89). These differences, however, were not statistically significant.

Johnson, Aragon, Shaik, and Palma-Rivas (2000) reported opposite results. Working with 19 graduate students in a Human Resources Development (HRD) program enrolled online and 19 graduate students enrolled in the same HRD class in a traditional setting, the researchers asked students to rate four components of the course using a five-point Likert scale. Traditional study participants had higher mean scores than online participants for each of the four components. The traditional student group reported greater overall satisfaction with the course (4.21 versus 3.58), greater satisfaction with the instructor (4.32 versus 3.79), and greater satisfaction with the level of interaction with other students in the course (3.23 versus 2.65).

Finally, traditional participants also gave a higher mean rating to the course organization and structure than the online participants (3.11 versus 2.74). Although the difference for the overall quality of the course was not statistically significant, it was for each of the other three categories at the .05 level.

Shea, Fredericksen, Pickett, Pelz, and Swan (2001) conducted a 2-year longitudinal study that examined satisfaction with online study for the State University of New York's Learning Network (SLN). Created for the 64 colleges and approximately 400,000 students in the university system, SLN offers online courses and programs to students across the nation.

Five thousand SLN students who took online courses from 1998 to 2000 were sent an emailed, 25 item, Likert-scaled questionnaire that asked about their level of satisfaction with online learning in general, the online courses they had taken, their level of

participation in those courses, and their level of interaction with the instructor. Of the 5000 students, 1974 returned the survey. The majority (79%) of respondents were “satisfied” or “very satisfied” with their online courses and 78% felt that they had learned as much or more online as they did in the classroom. Although only 47% felt they participated as much or more online as they did in the classroom, 60% felt that their interaction with the instructor in the online format was higher than in a classroom. The researchers found that high satisfaction correlated positively with interaction with course instructors. High satisfaction was positively correlated to student-instructor interactions ($r = .70$), “prompt feedback” ($r = .61$), and “clear expectations” from instructors ($r = .63$). Also, high satisfaction correlated positively with low reported levels of technical difficulty ($r = .32$), high interaction with classmates ($r = .38$), and satisfaction with computer helpdesk services ($r = .26$). Each correlation was significant at the .05 level.

In contrast, findings of dissatisfaction with online study have appeared in studies of performance in which online students outperformed lecture-discussion students. For example, Cheng, Lehman, and Armstrong (1991) found that the 28 online students in their study had less positive attitudes toward the online environment than did their 25 lecture-discussion counterparts. Post-course satisfaction surveys indicated a lower mean score for the group of online participants (45.23) as opposed to students who took the course in traditional classroom setting (49.41). Another indicator of concern about online study was the higher incompleteness rate. Of the 23 online students, 7 failed to finish the course while 1 of the 25 lecture-discussion students received an incomplete.

Despain (1997) had similar findings with the 80 undergraduate students randomly assigned to an online section of a beginning Spanish course. The online students earned higher grades than the students enrolled in the lecture-discussion section. However, post-course interviews indicated that while the online students had a “time advantage” that allowed them to more frequently practice the class exercises online, they had less positive attitudes toward working in an online setting, and were less satisfied with the course.

In Morrissey’s (1998) study of 208 MBA students, the 104 students randomly assigned to the online section of the management course achieved higher grades than the 104 students assigned to the lecture-discussion section. However, like Despain (1997), Morrissey found that compared to the students who completed the course in a traditional classroom, post-course survey data regarding satisfaction with the course indicated lower satisfaction among the online participant group.

Examining 23 undergraduates enrolled in an online psychology course and 21 undergraduates enrolled in the same course delivered by traditional means, Maki, Maki, Patterson, and Whitaker (2000) also reported lower levels of satisfaction with the course among online students when compared to their lecture-discussion counterparts. Once again, when grades were compared between the two groups, the online students outperformed the lecture-discussion students. However, interviews conducted upon the completion of the course revealed less satisfaction regarding the online setting as opposed to the traditional one.

While satisfaction has typically been studied alongside performance, one study dealt strictly with the satisfaction of online learners. Through interviews, Wegerif (1998), a proponent of online study, found that online students who failed or withdrew from their

course were highly dissatisfied with online study. He concluded that the students who were dissatisfied had failed to have what he termed a “threshold experience,” and were never able to become fully “invested” in the course. Unfortunately, the meaning of the term “threshold experience,” or how he reached his conclusion, were never clarified by Wegerif, nor was there any further examination into why students were dissatisfied.

In common with the studies of performance, the studies of satisfaction are limited in their usefulness in assessing the comparability of online and traditional classroom study. The majority of satisfaction studies used quantitative methods to get at how students felt about their online coursework. While such studies provide useful data, they provide limited information about the nature and meanings of students satisfaction or dissatisfaction. Johnson, Aragon, Shaik, and Palma-Rivas (2000) have criticized this approach as the measurement of satisfaction via “happy sheets” that are “typically limited to one-dimensional...perceptions of learners” (32).

Relatedly, the data were collected after the course was over. We have, therefore, post-course impressions from students. While that provides a measure of their overall impressions, it tells little about their satisfaction while engaged in the process of learning. Indeed, variation in the reported differences found in satisfaction studies raise questions about the nature of the student experience in online courses.

Student Experiences with Online Study

Recent studies involving Internet use and experience with online study raise questions about what students encounter in online study. Unlike studies that have sought to examine how students perform in online classes or how satisfied they are with their online

course(s), these studies approach the topic of students engaged in online study in a way that does not make a single, particular measure such as “performance” or “satisfaction” the focus. A study conducted by Stanford University’s Institute for the Quantitative Study of Society (SIQSS) indicates that social activities decrease as Internet use increases (O’Toole, 2000). In a sample of 4,113 adults who responded to surveys randomly distributed to online users, the majority reported that as their frequency of Internet use increased, time spent in social events outside the home and talking with others in person or on the phone, declined (O’Toole, 2000). Additionally, 16 percent of the employed study participant reported that with home internet access they spent more hours in the home working on job-related tasks.

The HOMENET project, an ongoing study of Carnegie Mellon University’s Human-Computer Interaction Institute, has examined the affective consequences of computer use. Studying 93 families in the Pittsburgh area who were provided with a computer and an Internet account, interview data revealed that family members classified as “high Internet use” individuals, regardless of different factors under examination, reported less social engagement, higher rates of depression, and poorer overall psychological well-being (Biemiller, 1998).

While neither of these studies dealt directly with college students, they do suggest possible negative outcomes associated with online study. The two studies suggest that one of the “costs” of online study involves a disengagement from direct socialization with other people. Worse, high computer use may produce other outcomes that are detrimental but not fully understood. Although these results have not emerged in existing studies of online student performance and/or satisfaction, that does not mean that these conditions do

not exist among college students who study online. Studies that have focused on performance and satisfaction have just not addressed such issues.

A few researchers have examined the experiences of college students with online study. Teaching an online and lecture-discussion course in human sexuality, Blonna (2000) found that students in the online class were generally more willing to share personal information and personal health issues in an online setting. One of the online students, for example, shared that she had experienced a rape and shortly thereafter, four other students in the online section discussed how they had also been sexually assaulted. While Blonna did not systematically study the students' experiences, and simply discussed accounts that students presented to him in interviews, he concluded that the ability to discuss personal accounts in an anonymous setting was a significant contributing factor to the greater openness he observed in his online section. Clearly, there remains a fertile source of information about online study in the experiences of students.

With regard to the issue of the importance of online students actively engaging with the instructional material online and countering Barker's (1994) contention that engagement was necessary for online students to achieve academic success, Yeo, Loss, and Zadnik (1998) found that students in an online physics course reported their engagement in the class to be limited, and made little use of the available multimedia applications meant to facilitate interactivity. Utilizing the case study method, the researchers divided the ten participants into two groups of five. In one group, students were permitted to work through the online multi-media exercises uninterrupted by the researchers. In the second group, the researcher would stop each participant at the conclusion of an exercise and ask them to

describe how they were working with the information and exercises presented to them. In both groups, participants reported an “intuitive sense” of what would be presented on the upcoming screen and found it unnecessary to fully read and attend to the entire set of screens to complete the assignment. Instead of interacting with each screen, participants sensed what would appear and passively advanced through the online exercises prior to completing them with little or no engagement with the course software.

Prior to the significant growth of online study, Feenberg (1987) theorized that “communication anxiety” would exist among online students due to the absence of the usual verbal and auditory cues that an individual experiences in a classroom setting. Studies in the 1990s appeared to confirm what Feenberg theorized. In a study conducted by Dede (1996), he found that undergraduate business students studying online related that they were generally anxious about establishing communication with the instructor and other students in an online setting. Specifically, these anxieties occurred at the beginning of the course when the students were attempting to become adjusted to working in an online environment. Interviews with these students also indicated they frequently became frustrated with technical problems they experienced during the course.

Examining why online students decided to discontinue their studies, Brown (1996) reported similar feelings of isolation. He randomly selected 170 online students from a total of 521 students who had dropped their online course(s) during the 1994 school year. Of the 148 who responded to a phone questionnaire, while some of the reasons students gave for withdrawing had to do with employment and family, Brown found that the majority were “internal” factors specific to the course. The factors are identified in Table 2-2 in terms of the mean score for the factor.

Table 2-2

Factors identified for withdrawal from online coursework

<u>Factor</u>	<u>Mean Score</u>
Difficult to contact tutors	3.58
Insufficient support from tutors	3.52
Course too time consuming	3.49
Change of employment	3.27
Feeling isolated from the university	3.10
Fees/costs too high	3.09
Change in family circumstances	3.00
More time needed with family	2.90
Expectations of course not met	2.85
Written materials inadequate	2.50
Course too difficult	2.33
Alternative course nearby	2.06
(1 = Not Important; 5 = Very Important)	

Hara and Kling (2000) examined the experience of six graduate students in an online course using a “qualitative, ethnographic case study” approach to get at the experience of studying online (4). This recent, intensive study serves as an excellent example of what is not investigated in performance or satisfaction studies. The course was an online seminar designed to teach graduate students from different academic disciplines about utilizing different kinds of information technologies that would be helpful in pursuing their graduate studies. All of the students except one, who was adept at utilizing a computer, had minimal experience with using a computer.

Data collection involved in-depth, individual interviews with each of the participants, observations of the participants in a computer lab during assigned group meetings, and examination of documents related to the course such as the syllabus and course reading assignments. Results were grouped into two separate areas. The first involved how

communication occurred between the instructor and students. The second focused on technological problems the students experienced throughout the course. With regard to instructor-student communication, excluding the student adept at computer use, the other five participants reported frustration with working alone at home during the evenings and weekends on problems that “typically can be discussed and resolved more readily in a face-to-face class meeting” (p. 10). The most frequently cited frustration-producing problem was obtaining feedback from the instructor on specific means for proceeding with course assignments. Students noted the instructor was not always available when needed and they were often unable to obtain clarification in order to complete an assignment.

Students also reported experiencing frustration with the “time lag” of feedback and clarification. For example, emailed or voice-mailed questions to instructors that were made near the end of the week sometimes were not answered until the weekend had passed. As a result, students reported having to spend more time working on assignments. Participants reported the additional time necessary for completing assignments produced a sense of isolation since, aside from intermittent group meetings, they worked alone. One participant noted experiencing frustration with sorting through and responding to various emails every time he logged on to work on his course. Another reported he felt a lack of feedback about his contributions to the course since he felt the email communications were too convoluted. He described how there was no way to be sure of what the instructor thought since there were no visual cues such as facial expressions and body language as one would have in a face-to-face setting.

Students also reported frustration with technical problems and the lack of support from the institution in the form of personnel to assist with technical difficulties.

Relatedly, some reported feeling intimidated by using the technology and felt frustrated with attempting to follow the directions of how to proceed on assignments. For example, one project was to design a simple web site to introduce themselves. Participants reported difficulty with completing the assignment with only written instructions since they were only beginning computer users. “Panic,” “frustration,” and “anger” were emotions cited by the participants (16).

Clearly, Hara and Kling’s (2000) study was limited by the small number of participants. In contrast, Rovai (2002), who examined whether online students experience “classroom community” and whether their sense of community differed from that of students enrolled in a traditional class, studied 326 students (274 traditional, 52 online) enrolled in 14 graduate and undergraduate courses (7 online; 7 traditional classroom) in a variety of areas such as education, government, organizational leadership, and science, in two urban universities. At the end of the semester, participants were given the Sense of Classroom Community Index (SCCI), a 40 item questionnaire with four subscales (spirit, trust, interaction, learning) that attempts to ascertain how students perceive the level of community that is present in their class (Rovai, 2002). To evaluate the questionnaire, a stepwise discriminant analysis was used for comparative purposes. As may be seen in Table 2-3, the means, standard deviations, and difference scores (df) for particular groups of items on the SCCI indicated enough variation at both the .05 level and .01 level to conclude that a sense of community could be fostered among online students:

Rovai also indicated that his results contradicted the notion that online students were at risk of becoming isolated (Hara & Kling, 2000), and recommended that faculty focus on clear communication about course expectations to build cohesiveness among

Table 2-3

Differences among SCCI item groups between online and traditional students

SCCI item	Online		Traditional		<u>Difference (df = 151)</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Similarity of Learner Needs	2.65	.65	2.91	.70	.26*
Recognition	2.88	.73	2.41	.87	.47**
Importance of Learning	3.50	.58	3.07	.70	.43**
Friendship	2.52	.98	2.79	.85	.27*
Thinking Critically	3.29	.67	2.84	.83	.45**
Acceptance	3.02	.64	2.66	.69	.36**

*p < .05, ** p < .01

students.

Working with 22 graduate students enrolled in an educational leadership course, Meyer (2003) examined how students perceived the discussions that took place online and in the classroom. The course was comprised of an online component as well as a lecture-discussion component that involved the students meeting on a weekly basis. Students were also required to “meet” regularly and discuss course material online between weekly meetings. After examining course evaluations distributed at the end of the term, Meyer reported that neither mode of discussion was perceived as advantageous over the other (2003). The “threaded discussions” that took place between the participants online were reported to have the benefit of allowing for more time among the students for reflection about what they were saying. Alternatively, discussion that occurred during the face-to-

face class sessions was perceived as having an “immediacy” and “energy” that was not experienced online.

In another comparative study conducted at Washington State University, Brown, Meyers, and Roy (2003) questioned whether students would report higher involvement when faculty who taught online had a primary role in the design of their courses. The researchers found that online students felt more involved in their coursework when faculty had an interactive role. One study group was comprised of 213 online students in which faculty participated in the development of the course while the other study group consisted of 28 online students in which faculty did not participate. Surveys were distributed electronically via email at the conclusion of both the Fall and Spring semesters. The survey asked questions about the promptness of feedback received from the instructor, the amount of time the participants spent on tasks related to the course, the amount of discussion that occurred between the instructor and other students, and whether the participants perceived they had learned new ways of thinking about material they encountered. A 4-point Likert rating was used for scoring (4 = very often, 3 = often, 2 = sometimes, 1 = never). Although the total number of students to whom the survey was distributed was not specified, 213 surveys from courses in which faculty were involved with the course design were returned. In the courses that did not include faculty, 28 surveys were collected. Students enrolled in courses where faculty were involved in the design process had a higher mean score in each the survey. Students in online courses with faculty involvement felt they received more prompt feedback (mean score 3.26) than did students enrolled in online courses without faculty involvement (mean score 2.57). Online students enrolled in courses with faculty involvement tended to spend more time on the course (mean score 2.90) than online

students enrolled in courses without faculty involvement (mean score 2.57). When asked about whether they discussed the course with other students outside the class, online students who were enrolled with courses where faculty were involved scored the item higher (2.99) than students enrolled in online courses where there was no faculty involvement (2.60). Online students also had a slightly higher mean score for questions related to whether they learned new ways of thinking about the course material when faculty were involved (2.305) as opposed to courses that did not incorporate faculty involvement (2.296). The researchers concluded that online students have a more positive learning experience with their course if faculty are engaged in the process of designing the course and interactive with their students throughout the semester.

Studies that focus on the experiences of online students have shown promise with regard to informing us about the nature of studying online. With the removal of the “templates” of performance and satisfaction, they have permitted researchers to more directly to examine online students and their experiences (Brown, 1996; Brown, Meyers, & Roy, 2003; Hara & Kling, 2000; Yeo, Loss, & Zadnik, 1998). Still, these studies are not without limitations. With the exception of Brown, Meyers, and Roy (2003) and Rovai (2002), these studies have not provided a comparison of the experiences of online students to the experiences of students in traditional classrooms. Additionally, data collection has occurred after students completed their online coursework (Brown, 1996; Brown, Meyers, and Roy, 2003; Rovai, 2003). Consequently, we still do not know enough about what occurs for online students during their experiences and how those experiences compare to those of students in traditional classrooms.

Summary

To date, what is known about online study comes primarily from studies that have focused on the performance of online students. There is clear evidence that online students can achieve at a higher level in terms of exam scores and course grades. Although some of the studies that have focused on performance contain results that are either incomplete or inaccurate, data from these studies have been widely used by supporters of online study as a means of demonstrating that online study is a viable if not superior option for institutions and students alike.

Studies of satisfaction with online study, often a part of performance studies, have produced equivocal results. Some studies have shown that students have been quite satisfied with their online course(s). Other studies have shown the opposite. Overall, the results from satisfaction studies indicate a need to know more about the online environment and experience.

Studies that involve the examination of the experiences of online students and how those experiences compare to those of traditional, lecture-discussion students have only recently entered in the body of available research about online study. Currently, no studies exist that utilize a comparative approach to directly examine the experiences of online students and traditional classroom students.

CHAPTER III

METHODS & PROCEDURES

Overview

The purpose of this study was to compare the experiences of community college students studying mathematics online and in a traditional classroom setting. The research questions that guided the study were:

- What are the experiences of community college students in the online mathematics course?
- What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?
- How do the experiences of community college students in the online mathematics course compare with those in the traditional, in-class mathematics course?

The methods and procedures utilized in this study are detailed in the chapter. The chapter is organized into six sections: research design; site and population; sources of data; procedures; data collection and analysis; verification procedures.

Research Design

A qualitative research approach was chosen for the conduct of this exploratory and descriptive study. Merriam (1998) describes qualitative research as “an umbrella concept covering several forms of inquiry that help us understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible” (p. 5).

Conceptually, the research design borrowed elements of phenomenology, which is said to underpin all forms of qualitative study (Patton, 1999). The particular focus of phenomenology on the “lived experience,” and of defining the “essence” of that

experience made the approach compelling for the examination of the experiences of online students (Van Manen, 1990). By studying a small number of subjects, the goal was to depict a shared, lived experience that involved a “blending of what is really present with what is imagined as present from the vantage point of possible meanings; thus a unity of the real world and the ideal” (Moustakas, 1994, p. 27). The extensive and prolonged engagement with study subjects demanded by a phenomenological approach allowed for the unfolding of patterns and relationships among meanings conveyed by study subjects, as well as for getting at their experiences from within that experience, the “lived experience.”

Furthermore, phenomenology’s emphasis on having the researcher set aside or “bracket” his/her own experiences in order to understand those of his informants/participants (Creswell, 1997) was most appropriate for this study. In other words, the subjects were placed at the forefront rather than the researcher which allowed for examining the experiences of the participants in as direct a manner as possible.

Nevertheless, to ensure that the participants reflected on the totality of the experience, several open-ended questions guided the interviews and journal entries. This approach diverged sharply from the traditional single question posed in a phenomenological experience, i.e., “Tell me about your experience of...”

Site and Population

Located in Knoxville, Tennessee, Pellissippi State Technical Community College (PSTCC), one of fourteen community colleges in the Tennessee Board of Regents system, served as the site for the study. Nearly 12,000 full and part-time students attend the institution. In addition, approximately 59% of the students in the fall, 2001 semester

intended to transfer to four-year institutions in the state to complete their bachelor's degrees.

The study involved 10 students enrolled at PSTCC, six participants were from the online section (OL) of the Fundamentals of Mathematics class (MATH-1010) and four participants were from the lecture-discussion section (LD) of the same course. Participants were recruited in two ways. For the online course, an invitation to participate in the study was posted on the course message board after a brief preliminary message introducing the researcher was posted by the instructor (Appendix A). Students were asked to respond to the researcher's email account or by telephone if they had an interest in participating in the study. For the lecture-discussion class, the researcher attended the class in January and made a brief, oral invitation to participate in the study and distributed a response form that allowed students to individually and confidentially express their interest in participating (Appendix A). Additionally, due to low interest in the original attempt to obtain participants, a cash incentive of \$20.00 was offered to the students in each of the math course sections upon the completion of all interviews and journal entries.

Partial payment was offered to participants for partial completion of interviews and journal entries.

Participants were required to have completed at least one semester of coursework at the college and have a minimum cumulative grade point average of 2.75 based on a 4.0 scale. Further, for the online students, this had to be their first online course. Subsequently, since only four students who initially indicated an interest in participating had a 2.75 or greater grade point average, the required grade point average was reduced to 2.0.

The instructor was selected based on the fact that she was teaching an online and lecture-discussion section of the MATH-1010 course in the same semester. Since 1992, the instructor selected for this study has taught a variety of math courses at PSTCC. More importantly, she was one of the first individuals in the Mathematics Department to venture into teaching math online, and has spent a significant amount of time developing her online courses. The instructor is thought of highly by her colleagues and students, and was awarded the “Outstanding Teacher of the Year” award in 2003. In particular, her students often comment on her easygoing, approachable, and caring teaching persona and they frequently remark that they perceive her as a friend as well as their instructor. Having grown up in a home that valued education (her mother was also a teacher), she is continuing this tradition by not only teaching at the college level, but also by pursuing a doctoral degree in curriculum development.

Sources of Data

Data were collected utilizing two methods, interviews and participant journals. First, all participants in the study completed a series of three tape-recorded interviews conducted during and shortly after the spring, 2002 semester (Slife & Williams, 1995). Interview questions in each of the three stages were open-ended and designed to permit the maximum amount of expression on the part of the participants about their experiences with online and traditional coursework (Appendices B, C, D). Additionally, to allow for scheduling flexibility throughout the data collection process, no specific completion dates were established for interviews. When rescheduling an interview became necessary, it was the researcher’s practice to schedule within two weeks after the initial interview date.

The interview questions and process were tested in a pilot study that was conducted during the fall, 2000 semester that modeled the design of this study (Merriam, 1998). The pilot study, that involved taped interviews and participant journals with three online and three lecture-discussion students enrolled in an introductory psychology course at Pellissippi State, served as a “final preparation for data collection” since it helped the researcher to more accurately plan for the collection of data during the formal study (Yin, 1994, p. 74). For example, the pilot project helped the researcher realize the necessity of creating three different interview protocols that could be utilized for data collection with each participant in the formal study. These protocols were arranged in stages and labeled “Introductory,” “Primary,” and “Reflective” to correspond with the point in the semester at which participants would be interviewed.

To coincide with the primary means of data collection, participants maintained a written journal during their involvement in the study. To coincide with the Introductory, Primary, and Reflective interviews, participants agreed to complete three journal documents and to submit them within three to five days after each scheduled interview had been completed. This afforded participants the opportunity to record and potentially expand their thoughts regarding their course experiences framed around questions provided to them by the researcher (Appendices E, F, G). Journal questions were developed in correspondence with the interview questions.

Procedures

Permission to conduct this study was obtained from the University of Tennessee’s Institutional Review Board and Pellissippi State’s Office of Institutional Effectiveness,

Research, and Planning (IERP) (Appendix H). After permission was obtained to conduct the research, permission was acquired from a mathematics instructor scheduled to teach the same course in an online and classroom setting.

Once the study participants were confirmed, individual meetings were arranged to inform students of their rights as participants. At this meeting, students signed an informed consent document that affirmed their understanding of the project, willingness to participate, and an understanding of their rights (Appendix I). Each was informed in this introductory meeting that they would receive a label and number in place of their name to maintain confidentiality. Consequently, the online students were labeled “OL” and assigned a number from 1 to 7 (OL-1, OL-2, OL-3, etc.) and the lecture-discussion participants were labeled “LD” and assigned a number from 1 to 7 (LD-1, LD-2, LD-3, etc.).

Originally, there were fourteen participants in the study, seven in each group. However, four participants dropped out at various points. One online subject completed her Introductory interview but had a family matter that required her to withdraw from school as well as the study. Two lecture-discussion subjects were scheduled for an initial interview, but did not keep their scheduled times and, after a week of attempting to contact them, had to be dropped from the study. After data collection had been completed, another lecture-discussion participant had to be dropped from the study because his cumulative grade point average fell below the re-stated criterion of 2.00 at the conclusion of the spring semester, 2002.

Introductory interviews took place during the month of February, approximately one month after the beginning of classes. These interviews focused on initial participant

impressions of their respective courses. Attention was also given to participant's reasons for selecting their respective course (online; in-class lecture-discussion) as well as any particular experiences they had encountered in their course (Appendix B).

Once all Introductory interviews had been conducted, Primary interviews were conducted in late March and April. The primary intent of this stage was to gather data concerning their experiences after the students had time to become accustomed to the course. It was also an opportunity to follow up with dialogue that had occurred between the researcher and participants in Introductory interviews (Appendix C).

Introductory and Primary interviews took place when the spring term was in progress. Reflective interviews, however, were conducted after the semester had concluded. All Reflective interviews with participants were held between May and July. This interview stage allowed students to review their course experiences after they had completed the course and had time away from the college. Similar to the two previous interview stages, Reflective interviews concentrated on student experiences with their course (Appendix D).

For all interviews, to ensure an appropriate interview setting for tape-recording, the researcher's office was utilized. Leave-time from the researcher's work duties was granted in order to minimize disturbances during interviewing. Within three to five days after each interview was recorded, the tape was transcribed into a Word file for analysis.

The same procedure was followed for the collection of journal documents. After the completion of the Introductory interview, participants were presented with a document that contained the same questions that were asked during the interview (Appendix E). Then, the researcher collected completed Introductory journal documents from each participant

within seven to ten days. Sometimes, it was not possible for journal documents to be collected in-person, and the participant was permitted to submit responses to journal questions via email. The same procedure was repeated for the Primary and Reflective interviews (Appendices F, G). All journal documents were transcribed into a Word file for analysis.

Data Collection and Analysis

Once interviews and participant journal documents were collected from all participants and transcribed into Word files, a series of analytic readings were conducted. Online participant interview transcripts were the first data source to be analyzed. This initial analysis involved a thorough reading and rereading of all transcripts that included identification of common phases, terms, and notions across responses to the interview questions. These elements were then clustered and tentatively coded using different-colored highlighters (Merriam, 1998).

Once this initial coding process was finished, the data were reviewed again to test and confirm the clusters that appeared to suggest possible themes characteristic of the experiences particular to the online group (Dukes, 1984; Yin, 1994). At the same time, the researcher made brief notes about the possible meaning of participant responses in the margins of the transcripts. Mindful of the fact that this was an initial reading of the interview data, these notes were not intended to commit the researcher to deciding if a particular theme was present. Instead, they served as reference points that were utilized when the researcher returned to the transcripts to conduct a second analysis.

After the completion of the first reading, online participant interview transcripts were analyzed a second time. During this analysis, the researcher utilized a set of different-colored pens to identify passages as well as terms that indicated a pattern or possible theme. For example, discussion of the need for “self discipline” emerged frequently in the set of introductory transcripts for the online participants. After the phrase and corresponding passages were identified that detailed why each participant felt “self discipline” was important, it was readily apparent that this was an initial theme that occurred among the entire online participant group.

This color-coding process continued throughout each set of transcripts utilizing the same color for each theme. Once the set of introductory interviews had been color-coded, the researcher proceeded to color-code the set of primary and reflective interview transcripts. This process initially took place with the three sets of online participant transcripts and allowed the researcher to discuss the results of the study in terms of what emerged during particular interview stages.

Once online interview transcripts were color-coded, the entire set of documents was arranged into like-colored arrangements. Tesch (1990) refers to this as a process of “decontextualization” and “recontextualization” that permits a more refined analysis (p. 97). Eventually, this process allowed for a more precise analysis than the one conducted during the first reading of interview documents. For example, the themes of “need for flexibility” and “self-discipline” were initially recognized during the first reading of the online participant transcripts. However, upon returning to the data for a second reading and further analyzing each theme, it became clear that a number of other statements indicated that another theme the researcher eventually entitled “good feel to the course” was present

for the online participants. The “decontextualizing” exercise of placing particular passages from each stage of the interview process and “recontextualizing” allowed the researcher to make this more exacting analysis (Tesch, 1990).

These analyses of the data collected from the online participants permitted the researcher to address the study’s first research question (“What are the experiences of community college students in the online mathematics course?”). Upon completing the analysis of interview and journal documents from the online participants, the same data provided by the lecture-discussion participants were analyzed in the same way to answer the second research question, “What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?”

Once a separate analysis of the online participant data and the lecture-discussion participant data was completed, a comparative analysis of the two data sets was undertaken. This contributed to answering the study’s final question, “How do the experiences of community college students in the online mathematics course compare with those in the traditional, in-class mathematics course?”

The themes identified in the analysis of the online participant data were compared with the themes identified during the analysis of the lecture-discussion participant data. During this analysis, comparisons were made in two ways. First, similar themes that appeared to surface in each study group were reported. For example, one of the themes that arose in each group was “social connection with other students.” Students in each class expressed a connectedness with each other and became more willing to ask questions in class to both the instructor and fellow students. Consequently, this result was reported as a theme common to both the online and lecture-discussion study groups.

Next, results that appeared as particular to either group were identified. For example, the entire group of online participants reported “self-discipline” as being fundamental to successful online study. This was not a theme that emerged for the lecture-discussion group.

Online and lecture-discussion participant journal documents were the second data source to be analyzed. The researcher followed the same process of analysis utilized while working with participant interview transcripts. Online participant journal documents were read twice, analyzed for themes, and color-coded using the same colors that were used to identify themes in the online participant interview transcripts. Themes that emerged in the online journal documents were then compared to themes that emerged in the online interview transcripts. Lecture-discussion journal documents were also read twice, analyzed for themes, and color-coded using the same colors that were used during the analysis of lecture-discussion interview transcripts. Themes that emerged in the lecture-discussion journal documents were compared to the themes that emerged in the lecture-discussion interview transcripts. Once a separate analysis of the two data sets was completed, a comparative analysis of the online and lecture-discussion journal documents was undertaken.

Finally, to increase the likelihood of the study’s internal validity, a third party reader was incorporated into the data analysis process (Appendix J). The reader was asked to make a careful, initial reading of the interview and journal documents. The reader was then asked to re-read the documents and make notes about the themes she discovered during her review of the online and the lecture-discussion participant data. She was then asked to make comparisons between the set of online participant data and lecture-discussion

participant data. This allowed the researcher to check the results of the study with an objective individual not associated with the study. Once this individual completed her analysis of the data, the researcher's results were compared to the results of the reader and permitted a confirmation of the themes that had been identified by the researcher.

Verification Procedures

In addition to conducting a thorough analysis of both interview and journal document data provided by the research participants, the researcher also conducted a series of activities to maximize the reliability and validity of the study. To enhance reliability, the procedures utilized for analysis were carefully identified and documented, and an audit trail was maintained (Merriam, 1998). By triangulating the separate analyses of interview documents, the journal documents, and a 3rd party analysis, the internal validity of the results was maximized. Internal validity was also enhanced by collecting perceptions throughout the experience (journal data) at three different points in the study.

Researcher Bias

In preparing to conduct the research, I recognized that my biases had the potential to influence the study. As a first step in attempting to reduce the affect of these biases on the study, I sought to make them explicit.

Working as an academic advisor, I was asked to promote online courses along with the institution's traditional offerings. This allowed me to note the responses to online study. This led me to two basic biases I had regarding online study. The first was that I perceived online study to be an environment that was fundamentally different from taking

a course in a traditional classroom. Concurrently, I believed other individuals would have the same perception.

The second bias related to individual attraction to or rejection of studying online. Even though online education was being touted as something for “everyone,” I never believed this to be true. And, as PSTCC grew its’ offering of online courses, I became convinced that I was correct. Based on the responses I had from students about studying online, I came to believe that an individual’s personality characteristics would either attract or repel them from the idea of studying online.

Mindful of the need to set aside my biases, simply making them explicit helped me to counter imposing them on the participant’s narratives of their experience. In so doing, I focused on allowing the students in the study to take me on their journey. After the data were analyzed to try to be sure that I had not influenced the answers I got from participants or the themes I derived from their narratives, I questioned my analysis once more in light of the biases to ensure that it represented the participants’ perspective rather than the researcher’s biases.

CHAPTER IV

FINDINGS

Overview

The purpose of this study was to compare the experiences of community college students studying mathematics online and in a traditional setting. The findings of the study are presented in this chapter in four sections.

The first section, *Presentation of Study Participants*, briefly introduces each participant who took part in the study. A presentation of the six online participants is followed by a presentation of the four lecture-discussion participants. The remaining three sections are organized in terms of the research questions:

- What are the experiences of community college students in an online mathematics course?
- What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?
- How do the experiences of community college students in the online mathematics course compare to those in the traditional, in-class mathematics course?

Presentation of Study Participants

This section presents brief descriptions of the online and lecture-discussion students who took part in this study. These descriptions are intended to familiarize the reader with the participants to allow for contextualizing and personalizing the results. There were six online participants who completed the study. Four were female and two were male. They were numbered OL-2 to OL-7 to protect their identity. OL-1 withdrew from the study prior to completing any of the interviews or journal entries.

OL-2

At the time of the study, OL-2 worked and attended school full-time. She also lived at home with her mother. Not wanting to begin college immediately after high school, she worked for two years before attending Pellissippi State. She attended three of her four classes at a branch-campus, and took the online math course to reduce the time she would have to spend on campus. An English major, who intended to transfer to the University of Tennessee-Knoxville, her cumulative grade point average for her first semester was 3.50, the highest among all of the participants.

OL-3

OL-3 worked full-time as an assistant in an academic office at Pellissippi State Community College, and was enrolled for four courses in the Spring, 2002 term. She was married, had two children, and, like OL-2, chose an online course to reduce the time she spent on campus. Unlike OL-2, however, she was enrolled entirely online. In 1992, she quit attending college prior to completing her first semester and considered the Spring, 2002 term her first “real” semester of school. Her cumulative grade point average was 3.36, and she planned on completing a two-year degree in Office Systems Technology.

OL-4

Like the majority of her online classmates, OL-4 worked full-time during the study. She also had a son whom she identified as a strong competitor for her attention as she attempted to complete the Spring, 2002 term. Like participants OL-2 and OL-3, OL-4 enrolled for an online course because she did not want to spend the majority of her

weekday evenings on campus. She was also enrolled for two on-campus courses in addition to the online class. Planning to transfer to the University of Tennessee-Knoxville as an English major, her grade point average was 3.10 at the time of this study.

OL-5

A broadcasting major, OL-5 worked full-time in computer and office equipment sales while maintaining a full-time course load of 12 credits. His cumulative grade point average was a 2.36 at the conclusion of the Fall, 2001 term. One interesting fact about OL-5 was that, while two of his four courses were held on campus, he readily expressed a preference for completing his degree entirely online if it were possible at PSTCC.

OL-6

Although OL-6 worked full-time from her home at the time of this study, she spent a great deal of time travelling for her employer. She was enrolled for the online math course in the Spring term as well as for two other courses. Of her three classes, she chose two online courses to accommodate her travel schedule. While her major was “undeclared,” OL-6 was seeking an Associate of Science degree and had a 3.0 grade point average at the time of the study. Unfortunately, OL-6 did not pass the mathematics course due to a variety of personal and work-related issues.

OL-7

Recently retired from the military, OL-7 worked full-time and was enrolled for 15 hours in the Spring, 2002 term. Valuing the time he spent with his wife and children, OL-7

selected a schedule that was entirely online in order to minimize his time away from home while he pursued his degree. His grade point average was 2.62 and he had chosen a two-year degree in Computer Accounting to compliment his job skills as a computer specialist.

Lecture-Discussion Students

There were four lecture-discussion participants who completed the study. Three were females and one was male. They were numbered LD-1 through LD-5 to protect their identity. LD-2 withdrew from the study after she completed the first interview. Data collected from her was not utilized for the study, and to protect her identity, her data were destroyed.

LD-1

LD-1 graduated from high school in 1999, but took time off to work prior to attending college. He was working part-time while enrolled for four courses. LD-1 was an “undeclared” student pursuing a general Associate of Arts degree. He resided at his family’s home in Knoxville and planned to transfer to the University of Tennessee-Knoxville. He was originally enrolled in the online course prior to the beginning of the spring, 2002 term, but changed to the lecture-discussion section based on discussions with the instructor. At the close of the Fall, 2001 term, his cumulative grade point average was 2.15.

LD-3

Describing herself as a “resident” of the college’s tutoring center, LD-3 made frequent use of the academic resources on campus. Struggling to regain her academic skills, LD-3 spent nearly seven years after high school working various jobs and travelling the country before enrolling in college. She admitted to struggling about choosing an academic program and with what she wanted to “do” with her life. A single parent, LD-3 planned on completing a general Associate of Arts degree at Pellissippi State before transferring to the University of Tennessee-Knoxville. Her cumulative grade point average at the conclusion of the Fall, 2001 term was 2.25, and she was enrolled for four courses during the Spring, 2002 term.

LD-4

Recently married, LD-4 was a 20 year-old undergraduate with a 2.50 cumulative grade point average at the time of this study. She was enrolled for four courses during the Spring, 2002 term. LD-4 planned to obtain a bachelor’s degree in psychology. She planned on completing as much coursework as possible at Pellissippi State, but was also preparing to move on short notice since her husband, a student at the University of Tennessee, was a member of the military awaiting assignment to another location.

LD-5

At the time of the study, LD-5 planned on pursuing her bachelor’s degree in nursing and had a cumulative grade point average of 2.76. During the Spring, 2002 term, she was

enrolled for four courses. She and her husband were expecting a child and making plans to move into an apartment at the conclusion of the term. She also considered herself lucky to not have to work since they resided with her mother who helped her care for a son from a previous marriage.

MATH-1010, Fundamentals of Mathematics

All of the participants completed MATH-1010, Fundamentals of Mathematics, in the Spring, 2002 term. The course was a broad review of various topics in mathematics designed primarily for non-math majors. Topics included a brief review of basic mathematics, algebra, geometry, consumer math, and probability and statistics. A copy of the syllabus, which was the same one used for both the online and lecture-discussion course appears in Appendix K.

While the syllabus was the same for each section, the manner in which students undertook each course was quite different. For the lecture-discussion class, it was like many undergraduate courses taught at colleges across the country. While the instructor did take what might be considered a unique approach to teaching math by assigning students to work in groups and encouraging discussion, the class met three days a week (Mondays, Wednesdays, and Fridays) for a 50 minute session. Students were expected to attend each class and take notes during the lecture portion of each class session. After the lecture, time was allotted for students to work on specific topics or problems in their groups. At different points in the semester, the instructor changed the groups as a means of allowing all students to become acquainted with one another. Additionally, homework was assigned but not always collected. This was an intentional strategy employed by the instructor as a

means of motivating students to work on their material. Quizzes and exams took place in class at regular intervals throughout the term.

For the online course, all students were assigned a password they used to log in to the specific site for the course. At the course site, a number of different components were incorporated as a means of presenting material to the students and helping to keep their work organized. For discussion with the instructor and other students, an electronic message board was provided where students could leave posts for the instructor and other students. The intent of the board was for general communication about upcoming subjects and to generate discussion about course topics. Students frequently made use of it to ask questions or help each other solve math problems. The instructor also monitored the board and, when appropriate, took part in the discussions. Similar to the lecture-discussion class, a textbook was required. However, the instructor also posted a link on the course site that took students to lectures created by the instructor herself about particular topics in the class (eventually, the instructor began to provide these electronic notes to her lecture-discussion students as well). A calendar to which the instructor referred was used to post dates by which time homework needed to be submitted and tests needed to be taken. Similar to the lecture-discussion class, homework was not always collected. When it was, most students submitted it via paper to the instructors office. Some took the option of emailing the instructor with their answers or sending her a Microsoft Word document with their work. However, unlike the lecture-discussion course, testing was different. Quizzes were presented to students in an online format. Software allowed the students to enter into the quiz portion of the web site and take a brief, timed quiz to demonstrate their competency.

For tests, students were required to come to the campus and test in the college testing center under the supervision of a test monitor.

Research Question One: What are the experiences of community college students in an online mathematics course?

The first research question dealt with how community college students experience an online mathematics course. Four themes emerged from the analysis of the interviews and journals for the six participants in the online group: need; self-discipline; good feel to the course; and social connection.

Need for Flexibility

Online participants chose online study to meet expressed needs. Like many traditional students, each of the online participants had a number of obligations along with their school commitments. All of them enrolled for the online course based on a similar need to manage a busy schedule. All of the six students who completed the study spoke about how the option to take a class without having to be physically present on campus was critical since it allowed them to meet other obligations. For example, OL-2 stated, "I'm taking classes at Blount County and they offered math either four or five days a week. My schedule at work is really hectic and I work full-time and couldn't schedule a class for that time during the day." Similarly, each of the other five online participants related how their full-time jobs prompted them to select online study.

Two distinct sub-groups emerged from the data. The first sub-group was labeled the "by-choice" group; the second, the "by circumstances" group. Participants OL-2, OL-5,

and OL-7 comprised the “by choice” sub-group. When they were asked why they chose to study online, they spoke about the various demands on their time, but also spoke enthusiastically about the perceived benefits of online study, i.e., they saw it as a positive, viable alternative to the traditional classroom. For example, OL-2 noted the flexibility of the online course. “I like how you can take tests at any campus and I like the videos – it feels like I’m sitting in a class all by myself and I can pause and stop whenever I don’t understand something.” OL-5 stated, “I can sit there and have a Coke or whatever...I can’t tell you how many times I made dinner, brought it to my office and read my stuff online and ate.” Finally, OL-7 related, “I really like the flexibility. You have so many more tools available to do your homework. It’s not like a traditional class where you go to the library and do your research.”

Participants OL-3, OL-4, and OL-6 comprised the “by circumstances” sub-group.” Like the “by choice” sub-group, all of them saw online study as a way to manage their busy schedules. What differentiated them from the “by choice” group, however, was the absence of a positive disposition toward online study per se, at least at the beginning. In their introductory interviews, work and family demands were seen as limiting factors that made an online course necessary. For example, when asked about why she chose to study online, OL-3 said, “I work and have two children and a husband ...which makes it hard to come back to school at night.” Similarly, OL-4 related how she worked “full-time...about 40 hours a week and I have a 3 year old son and can’t be gone for too long..” OL-6 also shared that she worked “more than 40 hours a week. Plus I have a family – no children but a husband I care for...I have a lot of constraints I have to work with.” Ultimately, this difference in perception influenced the “by circumstances” participants’ approach to the

course. When they discussed the demands on their time in their introductory interviews, “convenience” was cited by all of the participants as the primary motivation for choosing online study. OL-3 simply said, “With online, it’s more convenient and I can study at midnight if I want...” OL-6 worked from her home and was expecting to travel frequently for her job but, with the online course, she felt she could “do a couple of things that I need to do – like laundry. I can run an errand. Things like that.”

The difference in how the “by choice” and “by circumstances” students expressed their need for convenience also gave additional distinction to the two sub-groups. The “by choice” participants did not speak about having to take an online course out of necessity. Instead, they were enthused about the opportunity to structure school around their lives, and their preference for online study over traditional classroom study was readily apparent.

A recent high school graduate, OL-2, expressed this sense of enjoyment, even fun, at being able to study for her online course. “The fact that you can do it on your own time is what’s great about it. I really like being able to go to class in my pajamas when I want to...I mean, if you had a class, you’d have to get up and go drive there, there for an hour then come home and do your homework.”

OL-5, related the same enthusiasm for online learning:

“I don’t know if I could sit in lecture for three hours a night and go over two or three chapters. It’s so hard because you throw them all in there and they just start to run together. I know I couldn’t sit through a class and keep my concentration at a high level – that’s why I like the online class because it lets me fly...I really enjoy that.”

Finally, like his counterparts, OL-7 also conveyed the same sense of enjoyment

for the online course, “It’s fun – I’ve really enjoyed it so far...I’m more or less an independent learner. It helps my stress level since I’m able to do it when I want and work...It’s the luxury of ‘If I want to do it ahead of time, I can.’”

Conversely, the “by circumstances” participants, although thankful that online courses were an option, expressed a desire to take their classes on campus in a traditional format. They did not see an online course as a place where they could, like OL-5, “fly,” nor did they consider it a “luxury” like OL-7. Rather, OL-3 made it clear that online courses were not her first choice, “If I could I would take every class here at the college but I can’t. It’s impossible.”

OL-4 expressed similar sentiments. “I want to try to take two distance courses per semester – that way I can take 16 hours and graduate in two years. But it’s so much easier to take a class in school. You absorb it better...When you’re at home you put it off...the next thing you notice it’s 11 p.m. and you haven’t done your homework.”

Finally, OL-6, revealed the difficulty she was having with her online course during her second interview:

I tend to be a procrastinator. I’m taking three classes this semester which was a big mistake – one of them is on campus. I tend to do better with the class on campus because I have...someone I have to be accountable for.

You know, face to face! So I have to look like I know what I’m doing. But for the online class the measurement is the tests. I’ve been cramming for my online courses more than I like.

Self-Discipline

If “convenience” was the primary reason offered for selecting online study, self discipline was consistently identified as requisite for the successful completion of the course. Recognition of the need for self-discipline emerged throughout all of the interviews with each of the six participants. Speaking about how she lost her nervousness about undertaking the course, OL-2 described self-discipline as a routine. “You just have to get into the pattern of it all – watching the videos, doing the homework, staying on top of things. The teacher won’t be picking it up so it’s up to you to do it.” OL-3 described how the ability to be self-disciplined was an important difference between studying online and in a classroom. “I’ve never liked math and I think I surprised myself – I would recommend it to anyone who can stay disciplined and not get behind... You have to stay disciplined and stay on task...that’s the difference between online and traditional – you have to pace yourself so you’ll be ready on your own.”

Although the “by choice” and “by circumstances” sub-groups were aware of self-discipline as a skill necessary for successfully managing an online course, there were differences in how each sub-group experienced the need to apply discipline to their work. The “by choice” group appeared more ready and able to call on the self-discipline the course required than did the “by circumstances” group. OL-2 said, “I wasn’t thinking I’d need to see the teacher. I was thinking I’d need to set a schedule for myself and that I needed to get organized and know what I was getting into.” OL-5 noted, “I usually check once an hour on the math class message board if I’m at home... I do a little every day. I start to get ready for it, do all the homework, and review and take the test the last day so it

gives me as much room as possible.” OL-7 described a regimen similar for working on the course. His description of a “typical day” was:

They’re the same, pretty much – I’ve realized you have to do that. I go to work around 7am, get home around 6:15 or 6:30 p.m., then by the time I’ve recognized my family I’m sitting down at the table getting ready to crack the books around 8 p.m. I’ll study for about an hour and a half then take a break, then I’ll study again. I usually do that until around 11 p.m. I’ve got to do that to make it. I’ve been pretty religious about keeping to that.

In contrast, for the “by circumstances” group, while there was a clear awareness of the need for self-discipline, they were less able to employ it effectively and none conveyed the same level of confidence that the “by choice” group presented. A good example of this was provided by OL-6, who ultimately failed the course. She suggested the difficulty she would eventually encounter in her initial interview. “I thought it would be easy and flexible but it’s still hard to make yourself sit down and do the work.” As the semester progressed, unfortunately, additional conversations with her revealed she was rarely able to make herself “sit down” and “do the work.”

Fortunately, for participants OL-3 and OL-4, they had more success than OL-6 but they also had more trouble passing the course than did any of the “by choice” participants and had more doubts about their ability to be successful in the course. By the middle of the term, for example, OL-3 nearly withdrew from the course after taking a “week off:”

I worked on it every night after we [her family] got back from Florida...I just worked on it every night. Then I started preparing for the test...kind of almost cramming which I really don’t like to do but I did. I mean...I was

really taking a hard look at that last day to withdraw thinking maybe I should drop...But I talked myself out of it and I'm glad I did.

Suggesting a similar concern about the course that challenged her, OL-4 reflected:

I thought, 'This is a great class...and if I could just tell my brain to stop getting so nervous about it, I'd probably learn a lot faster.' So I just kind of sat down and picked a time where it was kind of low-key around the house and concentrated on it. For me, it was a little more difficult and I had to add my own structure to keep me, you know, to tell myself that I could do it.

Good Feel to the Course

Interestingly enough, all six online participants described the course as having a good feel. In other words, once participants became accustomed to the demands and expectations of studying mathematics online, they realized that the course was meeting the needs they had expressed at the start of the term and was, while challenging, enjoyable. There were differences in how each sub-group came to this realization. For the "by choice" participants, it happened almost from the beginning. For the "by circumstances" sub-group, it occurred much later in the semester.

For the "by choice" sub-group, OL-5, and OL-7 knew the course "felt right" immediately. In fact, in the Introductory interviews, OL-2 was the only "by choice" participant who did not report this. She needed a little time to adjust to the online setting. In her first interview, she admitted she had been nervous about the first week of the class, but quickly added, "now that I'm used to it, it doesn't seem too much like work when you're at home – just a lot more comfortable." She also noted in her first journal entry that

her online class had a “more relaxed and open” feel than her on-campus courses. “It’s more like a discussion instead of a lecture...it makes it a lot more comfortable,” she said.

From the onset of the course, OL-7 was enthused about the vast resources available to him online. He found them to be a great advantage to online study since “you have so many more tools available to do your work...all you have to do is ‘hyperlink-click’ and you’re there.” Similarly, in his first journal entry, OL-5 described it as being more “free” than his on-campus classes. Data from his Introductory interview revealed what he meant by the “freedom” he found in his online class:

It goes back to freedom and I have so much room at home – I spread everything out and I can just kick back there at the computer for, well, I’ve probably sat there for seven or eight hours doing my homework...Online you can read it at your own pace. It’s flexible – I may spend an hour and a half or two hours one night then only take 30 or 45 minutes the next. So it gives you some leeway. It just feels more comfortable – the math class is more enjoyable than it would be in lecture.”

For the three “by choice” participants, it took them little time to express their enjoyment and satisfaction with the course. The clearest example of this came from participant OL-5, who spoke about how well the course suited him in his Introductory interview. “Everything around me is a positive. I feel comfortable.” Summarizing how much he enjoyed studying online, he said, “I like...to read at my own pace. If we have all week to do five sections I can do the ones that give me trouble and skip the stuff I know how to do...A lecture just goes, ‘this is what we are doing’...I enjoy it (online study). I wish I could do the whole thing this way, but they won’t let me!”

OL-7 also quickly revealed how well the online math class worked for him. A month into the math class, he said, “It’s fun – I’ve really enjoyed it...it gives you a lot more flexibility...I’ve got an hour block I assign myself every day. I may spend an hour and a half or two hours then the next night only take about 30 minutes.” And, speaking about the interaction between himself and the interaction with other students online, he described how he thought interacting online was preferable:

“For me it’s the best of both worlds – you can get help when you need it on the message boards, you can email the instructor, you can talk to other students about a problem. You never feel like you’re alone...and you’re not locked in to having to be in a certain class at a certain time.

For OL-2, although she spent a period of time being “terrified” about whether she could successfully complete a math course online, she soon realized that the course was more than suitable. She described how the course worked well for her:

The freedom – being able to study when I wanted. If you studied on a Monday and didn’t feel like doing it the next Monday, you didn’t have to.

At first I tried to set aside times to study but that didn’t really work, so I just did it when I could...a few minutes here and a few there, which really became a routine.

After the course was over, she clearly felt that online study could work for her, “It’s amazing how well it all flowed together. I figured working full-time and school full-time would be hard, but it’s not as bad as I thought.”

For the “by circumstances” sub-group, the feel of the course was also good, but it took more time and effort on their part to come to this perception. Additionally, this feeling

did not occur for all three members. OL-6, while she found the lack of having to attend a class to be a convenient feature, was never able to discipline herself to complete the course. She often spoke about how she knew what she needed to perform in the course to be successful. She would often say, “I know I need to get working on this (math class).” And, like the “by choice” participants, she alluded to the positive features of the online class such as its’ convenience and flexibility. Unfortunately, she was never able to discipline herself like the others. Eventually, she failed the course.

However, for participants OL-3 and OL-4, a good feeling about studying online gradually emerged and became verifiable in their interviews and journal entries. This was evident that they had been able to incorporate the benefits they had perceived in studying online and realize what they hoped to accomplish.

OL-3 provided a clear account of how she transitioned from being fearful of the online experience to feeling good about the course. During her Reflective interview she indicated how she was far more receptive to continuing to pursue her degree by utilizing online learning:

I had a lot of fears...I was very apprehensive when I started the course.

Because it was math, because it was online, because I knew I wouldn’t have that face-to-face interaction with the instructor every day...But now I see there is a system that will work. I see that I can get the job done without the classroom...I’m even thinking of taking another math class online because of how I did with this one. I have more confidence in myself and my ability.

As OL-3 looked back on the course in her reflective interview, the elements of the other themes identified in the online participant data were present. Mindful of the need for

discipline, she still found that the course was convenient and felt good when she said, “I can pick the times when I want to work. So, in that regard, yes, it’s freeing (convenient)...you just have to be really disciplined.” She also commented on the social connection she had when she said, “If I can’t get an answer I’ll post a question (on the course message board)... It’s helpful...Usually when someone asks a question, about four or five people chime in and talk about how they solved it. We kind of boost each other up.” Therefore, as a result of being able to take advantage of the convenience and features of the course, it was clear that online study was successful for her:

I’m not as scared of it (math class) as I was when I first started. I know what to do and I know where to go for help...Overcoming the math anxiety – I think I’ve passed that and I think I’m learning some good skills.

For OL-4, even though online study was not her initial choice, looking back on her experience in her final interview she reflected, “It’s a lot different now. When I first started I was terrified...I didn’t know if I could do it or not. Then when we got started I knew it would be ok.”

Like OL-3, OL-4 had a similar experience. Gradually, her efforts were rewarded and she gained the confidence she needed. This was primarily apparent in her Reflective interview, and there were elements of other themes that had arisen in her earlier interviews that helped demonstrate how she was able to complete the course. With regard to disciplining herself to do the work, she said, “I had to add my own structure to it to keep me going and tell myself that I could do it.” She also recalled the social contact she made with other students and commented that it was “kind of like we were all in it (online course) together.” And, asked if she found the course to be convenient, she said, “I think so

– very much so. I actually did give me more time with my husband and my child.” Finally, she looked back on the course and summarized her perceptions of the course:

It’s a lot different (perceptions), really – when I first started I didn’t know if I could do it or not...then we got started and I knew it would be ok. I just really put my time in to doing it – it’s a lot more work than you expect...But after a couple of weeks, I’d gotten into a routine of doing things with the course.”

Social Connection with Fellow Students

The fourth theme that emerged from the participant data about the online experience was a social connection that developed among the students in the online course. Although none of the students met each other face-to-face, four of the six participants described a social connection that was established at the start of the class and maintained during the semester. Overall, they perceived this social connection helped them manage course expectations and demands. Contrary to the other themes, this social connection was perceived and valued by participants from each sub-group in a way that was not particular to either group.

In their interviews and journal entries, the participants related that they were required by the professor to introduce themselves to each other. According to the participants, this allowed them to establish initial relationships with each other and to share concerns about the class. OL-2 described the effect of this requirement. “We started out having to introduce ourselves to everyone on the message board. It really helped because it kind of

got everyone acquainted...Since then everyone just talks and asks questions – it feels like an actual class.”

As introductions and conversation among the students took place, a bond or “common ground” was established as the students shared anxieties they had about the online course. Three of the six online participants spoke of discussing their concerns with other online students. In her introduction to the rest of the class, OL-2 shared how she was “really nervous about missing something – an assignment or a test.” OL-3 conveyed the same general anxiety, “I was very apprehensive when I started the course – because it was math, because it was online, and because I knew I wouldn’t have that face-to-face interaction with the instructor.” Similarly, OL-4 said, “I kept thinking that old thing I heard that someone said two years ago when I started - ‘don’t take a math course online at Pellissippi!’ Like, I study...but I still think I won’t do well because it’s an online course.”

Sharing these anxieties served as a means for participants to support each other, and established interaction among them, which contributed to building and strengthening their social connections with one another. The bond that developed among the students was aptly portrayed by OL-5. “We’re all in this class together, we’re all going through the same thing. So if one person is having trouble, there’s a good chance that somebody else is having the same problem.” Likewise, OL-2 said, “The class so far has been really helpful...we kind of boost each other up.”

By the middle of the term, the apprehension had subsided. However, the “bond” that had been established at the start of the course continued. Participants related that they would return to the discussion board to “check in” with the class. OL-2 was the

first participant to note this continued interaction:

It has slowed down some – for the first chapter...we were using it a lot.

Then about three weeks ago someone just came on and asked how everyone was doing and said they noticed nobody had been posting any messages.

Then everybody started talking again!

OL-4 noticed the same lull and its' re-igniting. "A couple of us got on and started to talk or ask how things were going and that seemed to get things started again." Similarly, participant OL-6 noticed this regeneration of discussion. "There was one post ...where someone said, 'Hey, haven't heard from anyone in awhile! How's everyone doing?' That was neat – a lot of people chimed back and said everything was going really well and that they were fine."

By the end of the term, additional data indicated that these perceived social ties had persisted. OL-3, for example, never met any of the other students face-to-face, but she felt, "...this course seemed to encourage more socialization among other people in the class. Part of the college experience doesn't mean you shouldn't communicate with others. I liked making friends in the course – I might not ever see them but it was a nice experience to have."

Research Question Two: What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?

The second research question dealt with how community college students experience a math course taught in a traditional, lecture-discussion setting. Three themes emerged from the data collected from the lecture-discussion participants: preference for a structured learning environment, good experience with the course, and social connection.

Preference for a Structured Learning Environment

The initial theme that emerged from interviews with lecture-discussion students was their expressed need for a structured environment. In spite of their work schedules, none of the participants perceived being on campus as confining or constricting to their schedules. Instead, being in a classroom or on campus was their preferred environment for learning, one they perceived to be vital to their passing the mathematics course.

In their Introductory interviews, each participant began by describing how a structured learning environment provided discipline. For example, LD-1, the participant who had initially enrolled in the online section of the course, quickly became aware that he was more suited to learning in a classroom. “I can’t sit down and work the problems out myself...I’m just more of the type of learner for the class – more ‘hands on.’ You can email her [the professor] in the online class but that’s not the same...I don’t want to ‘go to class’ [study online] when I get home.” Instead, he needed “to be in a classroom – a place where I have to go to go to school.”

LD-3 expressed a need for structure to maximize her learning. In her journal, she added, “I think I do better in an academic environment.” In her first interview, her response to why she liked a classroom setting provided a more detailed answer:

I don’t think I would ever take an online course. I know if I don’t do my work at school I will not do it at home...I try to do everything here because it is really hard to focus at home...sometimes I’ll read in the cafeteria but the Tutoring Center is comfortable for me...I have to be in an area of knowledge to learn.

While LD-3 expressed a need to be “in an area of knowledge,” for LD-5 being able to both see the instructor and be physically present in the same room with the instructor best suited her needs. She perceived that her ability to learn math was encouraged “when the instructor is drawing on the board...working the problem out where I can go along with her.” Also, similar to LD-1, she expressed her desire for a “hands on” setting:

She has the classic figures of all the shapes and she handed them out...instead of seeing it on paper, you can really get it by actually seeing and touching it...it makes it a little easier, a little more clear in your mind...I have to see it to understand it...it helps if someone is there and I can hold it and look at it and manipulate it – you know, ‘hands on.’

Good Feel to the Course

As the term progressed, each of the four lecture-discussion participants spoke about how good the course was and how much they were enjoying it and learning. LD-4 described the situation aptly:

It’s probably my favorite class...it goes faster (than other classes) and it’s fun. It doesn’t even feel like ‘college’ where most people would be thinking a math class would be hard.

LD-1, who admitted that he “dreaded” math, described the class as “fun.” She [the instructor] does a good job – she makes it fun...her attitude and personality make it more enjoyable. She’s always upbeat.”

A number of participants in talking about how good their experience was, referred to the fact that the course was managed in a comfortable, laid back, and flexible manner.

They noted that they did not proceed through the course in a rigid manner. LD-3 observed, “We don’t go too slow or too fast. She [instructor] tries to feel her students in the class and know how they’re progressing.” LD-4 added, “More than once she’s (the professor) sensed that we get the concept of what she’s trying to teach, so we’ll move on...Or, we’ll spend more time on a certain topic if we ask for it or if she can tell that we need to.”

LD-5 plainly noted in her journal, “It’s [the course] laid back. If we carry over, it’s no problem,” and in her last interview, she provided a more detailed description:

I think the best way to explain it is like, she structured it to be unstructured...you’ll have your homework to review and you may do that for five minutes or you may do it for twenty. It depends on how hard it is (the material). We have a schedule but, if we carry it over to the next day it’s no problem.

The good feel of the course produced an important outcome. As the students became accustomed to the feel of the course, their motivation to put forth their best effort increased. In other words, the sense that the course was “fun” and “comfortable” made them feel like attending regularly and making the instructor aware of when they needed help. For example, as LD-1 talked about how he dreaded math, he went on to talk about how the attitude he sensed in the class made it easier for him to attend. “I felt better about just going to class – I mean, I know that’s something you have to do with math, but I just felt like going. I have another class where it’s not like that. You can just get the notes and it’s the same as going (to class).” LD-5 noticed her motivation increase on the very first day of the class:

I had the feeling that this course would be alright from the moment she (the instructor) walked in the door. We were in this really small room and she (instructor) kidded about it with us then said, 'Surprise! I know a bigger room and that's where we're going!' It was funny. I felt like it would be alright after that."

LD-4 also shared her sense of what helped her to feel more motivated. "You never felt like you couldn't ask a question in class. You never felt intimidated to say something when you didn't know how to do a problem." In her final interview, LD-4 commented, "We always felt like what we said mattered – like we had a voice or a say in something."

Social Connection with Fellow Students

The participants expressed a social connection with each other which they attributed primarily to the small work groups that were part of the course. Like the good feel about the course, this social connection emerged in the interviews and journals. Throughout the data students provided, they typically spoke about how the groups were formed, how the groups made the course different from other courses they had taken, and how the groups contributed to creating a social bond among the students.

As reported by the participants at the start of the course, the instructor announced that part of each class session would be devoted to working together in groups of three to four students. The primary intent of the small groups was to give the students approximately twenty to thirty minutes of each class to work on problems together after the lecture was presented. LD-3 gave a brief description about how the groups helped the students work together on problems. "You sit in a group with two or three other people and if you're

frustrated with a question your group helps you out. You can ask your group a question or [the instructor] a question.”

At the same time, however, the students in each group did more than work on math problems. They became aware that the small groups were an opportunity to socialize with each other in a less structured setting. LD-5 spoke about how the instructor became aware of the socializing that had begun and made allowances for groups to permit students to continue to get to know each other yet keep the focus on the course material:

She (the instructor) let us talk for the first five minutes about anything we wanted but then we had to do our homework. The whole ‘group thing’ was great...The whole purpose was to help each other...When you have three other people to work with at least one of them knew how to do a problem you couldn’t do.

LD-3 also spoke about how the group approach helped build social ties made the class a positive experience. “Being together really made the class a lot better – made the math seem easier. But you also get to know people, too, and that’s fun...the class is never boring where the instructor just lectures and doesn’t want you to talk.”

The groups established at the start changed during the term. After the first month of class, the instructor broke up the original four groups of three to four students each. While she let each student choose at least one person with whom they wanted to work, the second set of four groups was almost entirely different from the first set of groups. This gave the students opportunities to work with a number of different students, and further established the social connection among the members of the class. LD-4 explained:

She (the professor) started out with where we sat and the people around us. I was moving to a group where I knew one of the girls...but I didn't know the other three people in my group...but I got a chance to get to know them. So that helped a lot...you're not as scared because you know at least one person. Then, after she changed the group again in the middle of the semester, you know at least ten people from being in two different groups.

The social ties the small groups built become evident in the way lecture-discussion participants spoke about groups. Halfway through the semester, they began to notice a difference between the math class and other classes in which they were enrolled that did not have a means for students to become acquainted with each other. LD-4, for example, compared her experience in the math class with other classrooms. "Sometimes you go into a classroom and nobody is talking and there's no interaction...you're scared to say anything. That's not how it is with this class."

Gradually, the evidence that the students had formed a bond with each other grew. It became evident that they had come to rely on one another and appreciate the interaction that was fostered in the groups. Speaking about the intent of the groups as she perceived it, LD-5 echoed LD-4's comments. "The whole purpose was to help each other. I mean, some classes you just like come in and it's dead silence. Then the instructor lectures and that's it." Similarly, LD-1 observed, "You didn't feel like you were doing it by yourself...it was kind of like a break in class that wasn't really a break. It was good to be able to talk to someone."

Near the end of the term, the effect of the small groups became even more apparent, and students gave a more coherent presentation of the connections they had established.

LD-4 said, “In there (math class) we interact with each other...you don’t feel like you’re alone...you feel like you can ask whatever you need to ask.” And, after the semester had ended, LD-4 reflected on how a connection had formed among the class members:

We all really helped each other...we all worked together and have been able to choose our groups on our own. We even call each other when we can’t get a problem right and figure out how to do it over the phone.

Similarly, LD-3 said, “That’s something that helped – the groups. You just felt like you knew other people in the class.” Also, LD-5 spoke about how she felt connected to other students, “A lot of times it never felt like going to class – it felt like you were just going to some place where you knew everyone. That made it a lot better.”

The social connection experienced by the lecture-discussion participants also produced two related outcomes. First, rather than look solely to the instructor to teach and guide the class, the students took on the responsibility of teaching the material to each other. And that, in turn, strengthened the connection with one another:

You’d teach something to everyone in your group. If you didn’t get something, there was usually someone in your group who did understand how to work a problem. And when you did get it, you usually learned it better because it was a student working with a student – then you could usually go tell someone else how to do the problem once you get it. (LD-5).

Second, along with teaching the material to each other, the students also expected other members in the group to be accountable to each other. At one point LD-5 discussed

how students would get “chastised” by other group members for not doing their homework. While the tone of the chastising was generally lighthearted, it still had the effect of making members accountable to one another:

It’s like, “You slacker, you didn’t do your homework!” Everybody in your study group gets on you if you don’t get it done. You don’t have just the instructor coming down on you. Like this one guy in my group, he’s always like, “I’ve got problems outside of school with my girlfriend, and I can’t get it done!” And I got him really good...I said, “Well, my husband cheated on me three months after we were married and here I am! I still do my homework...oops! I win!” Then he said he had to work and I said, “Well, I work 25 hours a week, too...I win again!...Look I’m having a baby in three months and I spent most of this morning being sick...I win!” It was funny. Finally, he said, “Ok, ok, you win, I lose!”

Research Question Three: How do the experiences of community college students in the online mathematics course compare to those in the traditional, in-class mathematics course?

After comparing the themes provided by the online participant group (Need for Flexibility, Self-Discipline, Good Feel to the Course, Social Connection with Other Students) and lecture-discussion participant group (Preference for a Structured Learning Environment, Good Feel to the Course, Social Connection with Fellow Students), it became apparent that there were more commonalities than differences between the groups’

experiences. In fact, the similarities in experiences between the two groups were surprising.

The one major difference between the groups was with respect to self-discipline. While self-discipline can be seen as important to success in either setting, only the online participant group spoke about it. Students in the online group repeatedly and expressly stated that discipline to follow through on assigned work was absolutely critical to succeeding in an online course. While they recognized and prized the social support and encouragement they perceived from fellow online students, they commented on how they were responsible for completing the work on their own.

Nobody else was present to check if they had completed their homework prior to a quiz or test and, while the instructor arranged the course in a format that was easy to follow, it was up to them to be organized since there was no class to attend on a particular day or days of the week.

In contrast to this difference, there were a number of commonalities in the experiences of the online and lecture-discussion groups. Perhaps the most obvious similarity was the social connection formed among students within each group. Online students attributed the initial formation of the social connection to the course requirement that they regularly discuss course material (homework, specific problems, examples) with each other on the message board of the course web site. Over time, they shared how talking with the other students in the class became something they enjoyed and that helped foster social ties amongst them. One of the students captured the sense of how this group came to feel. She told about posting a message on the message board that she had noticed a lack of conversation among everyone and wondered how other students were doing. When people

responded and began conversing again, she felt that the bond she initially perceived was still present.

Similarly, lecture-discussion participants also perceived a social connection with the other members of their class. For them, this connection came about through working together in the small work-groups formed at the start of the class and restructured during the semester. As the semester progressed, participants related how these work-groups let them get to know one another and feel supported and confident about completing the course. At one point, according to one of the participants, one of the participants spoke about how the instructor allowed for five minutes of class time for the groups to talk freely among themselves, which indicated an acknowledgement of a connection among the students.

Another commonality shared by the online and lecture-discussion groups was the good feeling each group had about their course. In general, while the participants in each group found the course to be challenging, both the online and the lecture-discussion participants reported that their experience was a very positive one that they would repeat if given the opportunity. For the online participants, the “by choice” and “by circumstances” sub-groups characterized the feel of the course in ways that were both similar and unique. Both sub-groups shared how the course just felt good, how it really worked for them and allowed them to be successful. They attributed the good feel to what the instructor did and how she structured the course. All of the participants found her to be both approachable and readily available when they needed help, and they spoke about how this made them feel good about the course and allowed them to be successful.

Also, the social connection the online participants experienced contributed to the good feel of the course. Not only did the social support perceived by the participants help them to feel academically competent, it also helped them to feel more at ease about studying math online. This, too, was something fostered and structured by the teacher.

Likewise, for the lecture-discussion participants, their course also had a good feel. They perceived it to be fun and something that allowed them to learn successfully. They attributed it to two things, both of which related to the instructor and what she did. First, the instructor's style contributed greatly to their feelings about the class. They portrayed her as "laid back," which made them feel at-ease about the class, "energetic," and a teacher who made the class "fun."

Second, the work-groups the teacher required were seen as contributing to the good feeling students had about being there. Participants spoke about how they felt more confident in the course and more able to do the work successfully, since one of the requirements was to help their fellow group members by teaching the material to each other. One participant in particular spoke about how well she learned the course material since she had to communicate what she studied to her fellow students.

Additionally, both the instructor's style and the work-groups were identified by the lecture-discussion students as very different from what typically occurred in other classes. This also contributed to the class having a good feel. All of the students spoke about how they looked forward to going to the class since it did not "feel like an actual class." One student portrayed it as a "group of friends" who got together to just talk about math. Another contrasted it to the boredom he felt in his history course where the instructor did nothing more than take roll and lecture about the material. Inevitably, this participant

found himself “clock-watching” in his history class, but related how he never encountered feelings of boredom in the math class.

Finally, although there were obvious differences in the method by which the course was delivered, each group perceived that their course environment, whether online or lecture-discussion, was the best environment in which to study and learn. Among the online participants, the “by choice” students expressly chose online study because they desired a convenient setting that let them work independently and felt online coursework suited their way of learning better than the traditional classroom. For them, they needed little convincing that the online setting was appropriate and quickly adapted to the online setting. While the “by circumstances” participants did not have as much initial inclination to study online, they gradually changed their perception to one that viewed online study as a setting that was clearly capable of meeting their needs.

Similar to how the online participants perceived their environment, the lecture-discussion students believed the classroom was the best place for them to learn. They portrayed the classroom as something that provided the discipline and structure they needed to learn. Some students in this group shared how they knew they needed a class to attend because it required them to literally be in another location other than their home. Other participants spoke about how they were very “hands on” learners or needed immediate access to an instructor that, based on the setting that they felt worked best for their needs, could only be provided by a classroom.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

The purpose of this study was to describe the experiences of community college students studying online and in a traditional setting. Ten students enrolled in either the online or lecture-discussion math course taught by the same professor. Six of the ten students were in the online math section, while four were in the lecture-discussion section. Participants were interviewed at the beginning, during, and at the end of the course. In addition, participants maintained an on-going journal about their experiences.

Data from the interviews and journals were analyzed for themes by group (online and lecture-discussion) to answer the research questions guiding the study:

- What are the experiences of community college students in an online mathematics course?
- What are the experiences of community college students in the same mathematics course taught in a traditional, in-class setting?
- How do the experiences of community college students in the online mathematics course compare to those in the traditional, in-class mathematics course?

Summary of the Findings

Four themes characterized the experiences of the online participants. The first theme, a specific need to study online, was cited by all of the online participants at an early stage of data collection. The second theme, self-discipline, was also cited by each online participant. While acknowledging that self-discipline was necessary in traditional classes they had taken, participants described the need to be disciplined in an online course as vital

to success. The third theme related to how the course had a good feel since participants described their experience with the course as a positive one that they enjoyed. The fourth theme that emerged from the data was the social connection that developed among the members of the group.

Three themes characterized the experiences of the lecture-discussion participants. The first theme, “preference for a structured learning environment,” dealt with how each participant sought a structured environment and had a preference for learning that was “hands on” where they could see examples and interact directly with the instructor. The second theme dealt with perception participants gave a good feel to the class. Like the online participants, each participant perceived their class to be positive and enjoyable. The third theme was “social connectedness.” Each of the participants experienced a connection to the other students in the course which emerged as they worked with one another.

For both groups, more commonalities were present than differences. The online participants identified self-discipline as a vital skill to completing online study, which was determined to be a clear difference between the groups. The connectedness each group experienced with their classmates was clearly shared by online and lecture-discussion participants. Each group also shared how their respective course had a good, positive feel. The good feel for each group was attributed primarily to the instructor. In the perception of the students, she made the course both fun and challenging, and created an environment where they felt comfortable to acquire the skills they needed to be successful in the course. Finally, another similarity dealt with how each group perceived their chosen environment for learning as the best for their needs.

Discussion

The most significant finding that arose from the study was also the most unexpected. The two environments, an online setting and a traditional classroom, yielded more similarities than differences with regard to how the participants experienced them. While there is ample literature that shows how online students tend to outperform traditional students (Barker, 1994; Cheng, Lehman, & Armstrong, 1991; Despain, 1997; Dutton, Dutton & Perry, 1999; Gubernick & Eberling, 1997; Lander, 1999; Maki, Maki, Patterson & Whitaker, 2000; Mesher, 1999; Morrissey, 1998; Navarro & Shoemaker, 1999; Redding & Rotzien, 1999; Russell, 1999; Schutte, 1996) and are as satisfied as their peers in traditional classrooms (Shae, Frederickson, Pickett, Pelz & Swann, 2001; Wegner, Holloway & Garton, 1999), recent literature has suggested that the two environments are different, and that the online environment may have serious negative affective consequences. Biemiller (1998), for example, has noted higher incidents of depression and poorer psychological well-being as use of the internet increased among families, some of whom were students. This did not appear to be the case in this study. Nor were the results of this study comparable to the work of Yeo, Loss and Zadnick (1998), who found that online physics students had little engagement with the course material. On the contrary, online students in this study showed no overt signs of depression or disengagement, and were more like their counterparts in the lecture-discussion group in their positive feel about the course and high level of social connection with other members of their group. Indeed, the very “sameness” of their experience was striking and unanticipated on the basis of the latest research.

What accounts for this similarity of experience? The good feeling, positive experience, and social connection that participants reported is attributable to the instructor and the way she structured and conducted the course. What she did made the experiences more similar than different and produced the common responses between the groups. By having her online students communicate regularly with her and the other students on the course message board and by having her lecture-discussion students work on problems and examples in small groups, she incorporated a means for students in each section to establish relationships with one another. Participants from both the online and lecture-discussion sections described the “bond” or “connection” they experienced as a result of working with fellow students. For the online students, the feedback they gave about communicating with the instructor and other students ran in direct contrast to the “communication anxieties” that Feenberg (1987) theorized online students would have and Dede (1996) found in his work with undergraduate business students.

To further establish a similar experience for both sections, the instructor also established a clear routine for her online section to follow. She did this primarily by setting the online course up as if it met on Mondays, Wednesdays, and Fridays. This gave the students an opportunity to work on course assignments at regular times, and served as a basis for what the participants referred to as a “repetitive routine” that allowed them to establish a measured approach to proceeding through the class.

Ultimately, this “sameness” produced an outcome that was in contrast to the findings of Hara and Kling (2000). In their study, they found that anxieties experienced by online students persisted throughout the semester. This was not the case for this study. The instructor appeared to anticipate concerns her online students might have and employed

strategies to address the concerns and ensure a similarity of experience to the lecture-discussion section.

The strong social connection experienced by the online group was in marked contrast to findings of previous studies. In Morrissey's (1998) study, online participants reported low "cohesion" among the group while lecture-discussion participants reported strong group "cohesion." His lecture-group indicated that a strong social bond had formed among the entire class. However, in this study, the online participant group experienced a connection that, based on the data they provided in their interviews and journals, was as strong as the connection that was experienced among the lecture-discussion students. Clearly, socializing proved to be valuable to both the online and lecture-discussion students in this study, and it is reasonable to suggest that building a social component into other online classes would produce similar results. One vital component of becoming more educated does not take place between the instructor and student. Instead, it occurs when students have the chance to gather, get to know one another, and exchange their own thoughts and ideas. And, unlike Brown (1996), who reported findings of isolation among online students as a reason for withdrawing from online study, none of the online students in this study reported feelings of being isolated. Indeed, the opposite occurred.

Finally, while only three of the five online participants chose online study, their reasons for choosing it are interesting and suggestive. They indicated that they saw it as a superior learning environment, one which better suited their learning needs than a traditional classroom. While the study involved few participants, it is clear that there are individuals who are drawn to online study and perceive it as equal to or superior to classroom learning. Participants in both participant groups of this study believed that their

selected course was the best setting to meet their needs, however, a group of online participants consciously sought out the qualities that define online study – independence, flexibility in scheduling, and working at their own pace.

Conclusions

Based on the findings of the study, it is reasonable to suggest that the instructor is a critical variable in whether or not online and lecture-discussion courses are perceived by students as satisfactory to their learning. The extent to which an instructor can influence an online course is an area that has not been widely examined. However, it is reasonable to conclude from the findings of this study that the ability or lack of ability of the instructor to make the experiences comparable may account for differences in findings about the comparability of online and lecture-discussion formats. It is also reasonable to conclude that, while students may be able to adapt to online coursework, they are likely to have more anxieties and problems unless the instructor is skilled in making the online course comparable to a lecture-discussion course. At the same time, students appear to have a clear sense of what class environment works for them, particularly those who seek out online study. This may be helpful for advisors to consider as they help students choose between online or traditional courses.

Recommendations for Further Study

Three recommendations are proposed for conducting additional inquiry into the experiences of online students.

The first recommendation would be to replicate the study with larger numbers of participants to see if the results are similar. This study had a small number of participants in each section of the course. The results, therefore, are challengeable based on the size of the groups. It would be valuable to conduct a study involving an entire class of twenty or more students in each setting. Replication with larger groups of participants could also allow for verification of the specific themes that arose in this study.

A second recommendation would be to study other online and lecture- discussion courses taught by the same instructor. This would permit a researcher to see if the results from this study were unique, attributable to the particular activities undertaken by the instructor delivering the course. If additional studies were conducted with the same instructor and the results were replicated, it would strengthen the case that this study seems to be making; namely, that the role the instructor plays in anticipating and preparing for the needs of online students can make a significant impact on the quality of their course experience.

Another recommendation would be to replicate this study using different instructors for the online and lecture-discussion sections, and varying approaches. For example, what would student experiences with their online courses be like with an instructor who presented him or herself as difficult to approach or contact? Brown, Meyers, and Roy (2003) found that students felt more involved when faculty had an active role in the design of an online course. It would, therefore, be worthwhile to conduct a study in which the instructor's actions were perceived as challenging to the cohesiveness of the class as a means of determining the importance the instructor plays in delivering an online course.

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APPENDICES

APPENDICES

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Appendix A
Invitation to Participate in Research

INVITATION TO PARTICIPATE IN RESEARCH

REQUEST FOR VOLUNTEERS

My name is Mike North. I am a counselor at Pellissippi State and a doctoral student in the University of Tennessee's College of Education. I am completing a research project that examines the experiences students have with online study and traditional classroom study. I would like to ask for volunteers to help me. If you are interested in volunteering, there will be a space for you to provide your contact information at the bottom of this document.

PROJECT SPECIFICS

- This study will involve 3-4 hours of your time over the next 3-4 months
- Most of the data will come from individual interviews I arrange with you
- You will also be asked to keep a brief journal of your experiences as a student
- Interviews will last 30-45 minutes and focus on your course experiences(s)
- Interviews will be convenient for you – we can meet on campus
- Interviews will be tape-recorded
- Your participation in this study will be confidential
- At the conclusion of the study, tapes and transcribed documents of interviews will be destroyed
- Upon completion of the three interviews and journal entries, each participant will be paid a sum of \$20.00

BENEFITS

- If you are interested in conducting research or considering graduate study, this is a good opportunity to gain exposure to the research process
- You will be involved in every aspect of the project. I will answer any questions you have and provide you with any information you request.

CHECK IF YOU ARE INTERESTED (there is no obligation to check "Yes")

[] Yes, I am interested in volunteering as a study participant. Please contact me:

Name:

(please print)

Phone:

e-mail

Appendix B
Introductory Interview Protocol

Participant #:

Why did you enroll in this course?

Describe what a typical day is like for you here (at school)?

What's a typical class session like?

Tell me about the course so far – anything that is on your mind.

Potential follow-up questions:

What is your experience like?

How does it compare with other class experiences you've had?

Would you recommend the course to people you know? Why or why not?

What else comes to mind about your experience with this course so far?

Date Completed:

Appendix C
Primary Interview Protocol

Participant #:

In general, how has the semester gone for you so far?

What are your days like for you now (recall we talked about what a “typical” day was like for you here?)

What is the course like now compared to when you started?

What else – anything – is on your mind about the course?

Potential Follow-up Questions:

What is your experience like now?

Is there anything different about how you’d compare it to other courses?

Would you still recommend it?

Date Completed:

Appendix D
Reflective Interview Protocol

Participant #:

How would you describe your experience with this course?

Think about when you first began the course – what are your perceptions of the course now compared to then?

Tell me about a challenging experience you had with the course and whether you were able to overcome it.

Is your favorite part of the course still the same?

Why or why not?

What about your least favorite part?

Do you think you got what you wanted out of the course?

Why or why not?

Tell me anything that is on your mind about your experience with this course.

Date Completed:

Appendix E
Journal Document #1

Participant #:

Instructions to Participant: Please provide your candid, written responses to the following questions. Please try to respond to each question with as much information as possible. If necessary, attach additional sheets for your responses. Recall your responses are confidential.

1. Describe your first impressions of this course:
2. What has made the strongest impression on you about this course?
3. How does it compare to other classes you've had?
4. Would you recommend it – why or why not?
5. To date, how has this course gone for you – what has your experience been like?

Date Returned:

Appendix F
Journal Document #2

Participant #:

Instructions to Participant: Please provide your candid, written responses to the following questions. Please try to respond to each question with as much information as possible. If necessary, attach additional sheets for your responses. Recall your responses are confidential.

1. What are your impressions of this course now compared to when you started?
2. What has made the strongest impression on you about this class?
3. To date, how has the course gone? What has your experience been like?

Date Returned:

Appendix G
Journal Document #3

Participant #:

Instructions to Participant: Please provide your candid, written responses to the following questions. Please try to respond to each question with as much information as possible. If needed, attach additional sheets for your responses. Recall your responses are confidential.

1. Overall, how would you describe your experience with this course?
2. What was your first impression with this course and how does it compare with your impressions of this course now that it's over?
3. What was your most positive experience with this class?
 - 3, a. What was your most negative?
4. If you knew someone who was about to take this class, what would you say to that person?

Date Returned:

Appendix H

Letter of Approval to Conduct Research at Pellissippi State Technical Community College

INSTITUTIONAL EFFECTIVENESS, RESEARCH AND PLANNING

TO: Mr. Mike North

FROM: Dr. Sharon Yarbrough
Director Institutional Effectiveness, Research, and Planning

DATE: December 7, 2001

SUBJECT: Approval to Conduct Research at Pellissippi State
Technical Community College

Dr. Bruns forwarded your request to this office. With the submission and review of the summary of your dissertation proposal and the Interview Protocol, approval has been granted for you to conduct research as described in your request dated December 4, 2001. For your research, please inform the students that their "participation in your study is voluntary and not a requirement of Pellissippi State."

Dr. Jim Kelley has indicated he and Ada Koho will work with you during your research activity.

We request, when completed, a copy of the results of the research for our records (Institutional Effectiveness, Research, and Planning office, Goins 226). We do not expect to receive the entire dissertation but results (conclusions/recommendations) of your research.

Should you have questions, please give me a call at 694-6526. Best of luck to you as you complete this "activity."

cc: Dr. Jim Bruns
Dr. Jim Kelley

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE

PHONE: 865-694-6526 * FAX: 865-694-6435

10915 HARDIN VALLEY ROAD * P.O. BOX 22990 * KNOXVILLE, TENNESSEE 37933-0900

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AN AA/EEO COLLEGE

Appendix I Informed Consent Form

Project Title: Examining the Experiences of Students Engaged in Online Study

You are invited to participate in a research project. The purpose is to explore the experiences of online and traditional students and make comparative evaluations between those experiences. No fewer than five online and five traditional, lecture-discussion students will be selected to participate. The primary methods of data collection will be interviews and participant-maintained journals.

Three 30-45 minute interviews involving note-taking by the researcher and, upon permission from the participant, tape-recorded dialogue, will take place from January, 2002 to June, 2002. Three journal entries completed on documents provided by the researcher and corresponding with the time of each interview will be completed from January, 2002 to June, 2002.

Risks

No risks to you are foreseeable by participating in this study.

Benefits

By agreeing to participate in this study, you will benefit by becoming acquainted with the processes of conducting qualitative research. The information you supply will also benefit researchers interested in the focus of this project. Upon the conclusion of interviews and journal entries, you will receive a payment of \$20. Partial payment will be provided if you discontinue participation.

Confidentiality

The information in the study records will be kept confidential. Data will be stored securely and available only to persons conducting the study who have also signed a confidentiality statement unless you specifically give permission in writing to do otherwise. No reference will be made in oral or written reports which could link you to the study.

Contact

If you have questions at any time about the study or the study procedures (or experience adverse effects as a result of participating in this study), you may contact the researcher, Mike North, at Pellissippi State (865-694-6402) or the researcher's faculty advisor, Dr. Jeff Aper, at the University of Tennessee, College of Education at (865) 974-2216. If you have questions about your rights as a participant, contact the Research Compliance Services section, Office of Research at (865) 974-3466.

Participation

Your participation in this study is voluntary and is not a requirement of Pellissippi State; you may decline to participate without penalty. If you participate, you may withdraw at any time without penalty. If you withdraw from the study, your data will be returned to you or destroyed.

Consent

I have read the above information and agree to participate. I have received a copy of this form.

Participant's Name (print) _____ Participant's Signature _____
Date _____

Appendix J
Letter Requesting Assistance

December 2, 2002

Dear Ms. Lebreton:

Once again, thank you for your willingness to assist me with my research. I am very interested in what you have to say. Your review of both the transcripts and journal documents will strengthen my argument that the study I have conducted is valid.

Earlier this year, you were presented with copies of the transcripts from interviews with each of the participants in my study. You were also presented with copies of the journal documents made by each participant and a summary of the purpose of my study. To review, the following will assist you as you summarize your interpretations of the data:

- OL stands for "Online Participant"
- LD stands for "Lecture-Discussion Participant"
- A total of 30 interviews were conducted between February-June, 2002
- 18 interviews were with online students, 12 with lecture-discussion students
- Interviews with the two groups (OL & LD) were divided into three segments: Introductory, Primary, and Reflective

My request to you is relatively simple. Please carefully read each interview transcript and journal document. Once you have read the documents, please try to identify any "themes" you think emerged from the data. Please try to identify particular themes for the online group. Then, do the same for the lecture-discussion participant group. Finally, please provide a brief comparative evaluation of the data after working with each set of interview and journal transcripts separately.

Thanks again for your assistance with my research. Your contributions will be a great help as I work to complete this project. Should you have any questions, please contact me by phone (865-694-6402) or email (mnorth@pstcc.edu).

Sincerely,

Mike North

Appendix K MATH 1010 Course Syllabus

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE

Survey of Mathematics MATH 1010 (formerly MTH 1100)

Credit Hours: 3

Catalog Course Description:

Topics include critical thinking skills, problem solving, logic, geometry with some right triangle trigonometry, consumer math, probability and statistics.

Entry Level Standards:

Students must be able to read at the college level.

Prerequisites:

High school algebra I, algebra II and ACT math score of at least 19, or DSPM 0850 or equivalent math placement score.

Textbook:

Miller, Charles D. and Vern E. Heereen and John Hornsby. *Mathematical Ideas*, 10th ed., Addison Wesley Publishing Co., 2004

Personal Equipment:

A basic scientific calculator is required. A graphing calculator is recommended.

I. Week/Unit/Topic Basis:

Week	Topic
1	Critical thinking skills and problem solving; 1.1, 1.2, 1.3
2	Set Theory; 2.1, 2.2, 2.3, 2.4
3	Logic; 3.1, 3.2, 3.3
4	Logic; 3.4, 3.6; Review, Test 1
5	Geometry; 9.1 - 9.4
6	Geometry, Angles, Right Triangles; 9.5, 10.1, 10.4
7	Right Triangle Trigonometry; 10.5; Review, Test 2
8	Counting Methods for Probability; 11.1-11.4
9	Probability; 12.1 - 12.3, 12.5
10	Statistics; 13.1 - 13.3
11	The Normal Distribution; 13.5; Review, Test 3
12	Consumer Math; 14.1, 14.2
13	Loans, House Purchase; 14.3, 14.4
14	Metric System; Appendix A; Review, Exam 4; Review for Final
15	Comprehensive Final Exam

At the discretion of the individual instructor, some changes in the above schedule are possible for this course. Some textbooks sections can be added, and some sections can be omitted.

II. Course Objectives*:

- A. Translate verbal and written situations into a problem-solving format. VI.3,4
- B. Master the logic necessary to interpret set notation, Venn diagrams, and truth tables. VI.1,4
- C. Master the critical thinking skills necessary for success in the student's discipline and life. VI.1,2,4
- D. Master geometric principles necessary for success in the student's discipline. VI.2,3
- E. Learn enough basic right triangle trigonometry to apply it in current problem solving and future course work. VI.1,2,3,4,5
- F. Use mathematics to solve personal everyday financial problems. VI.2,3,4,5
- G. Use the basic principles of probability. VI.2,4
- H. Collect and assemble quantitative data, making wide use of tables and graphs. VI.3,4,5,6
- I. Apply principles in statistics to solve real-world problems. VI.2,4,6

*Roman numerals after course objectives reference goals of the Mathematics department/program.

III. Instructional Processes*:

Students will:

1. Successfully convert sentences into statements in logic and then draw correct conclusions. *Active Learning Strategy, Transitional Strategy*
2. Use algorithmic processes to solve problems deductively. Use these processes to solve application problems in areas such as business and finance. *Mathematics Outcome, Active Learning Strategy*
3. Work, either individually or in a group setting, to solve problems from different occupational fields. Solutions must be mathematically correct and be clear and correct in terms of the related occupational field. An example might include using sets and Venn Diagrams to use given information about number of employees and employee preferences and dislikes to determine an optimal reorganization of those employees into smaller work groups. *Mathematics Outcome, Active Learning Strategy, Transitional Strategy*
4. Use a scientific or graphing calculator to solve math of finance problems. Formulas are provided, but the student must determine which formulas to use and when to use them. The student must also be able to use the calculator to get correct results, working with numbers that are often very large and that need to have exponents correctly applied to them. *Mathematics Outcome, Active Learning Strategy, Technological Literacy Outcome*

*Strategies and outcomes listed after instructional processes reference Mississippi State's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Use set notation and Venn diagrams in application problems. B
2. Utilize inductive and deductive reasoning. A, C
3. Use truth tables and the laws of logic to draw conclusions. A, B
4. Translate verbal and written situations into problem-solving models. A, C, H, I
5. Solve problems using geometry and right triangle trigonometry. A, D, E
6. Solve measurement problems involving metric system units. H
7. Calculate simple and compound interest, annuities, and loans. F
8. Solve basic probability problems. G
9. Graph a frequency distribution as a bar graph and a line graph. H, I
10. Use normal curves and z-score tables to solve applied problems. A, B, C, H, I
11. Research library texts related to major and write a word problem demonstrating application of math in that major. H

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

- A. Testing Procedures: Students are evaluated primarily on the basis of tests, quizzes, research paper and a comprehensive final exam. A minimum of 4 chapter tests is recommended.
- B. Laboratory Expectations: As assigned by instructor.
- C. Field Work: As assigned by instructor.
- D. Other Evaluation Methods: The assigned research activity can count no more than half of an individual test grade; where appropriate, grammar and syntax will be evaluated in addition to the content. Other as assigned by instructor.

E. Grading Scale:

93 - 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
70 - 77	C
60 - 69	D
Below 60	F

VI. Policies:**A. Attendance Policy:**

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

C. Make-up work: Instructor discretion about make-up tests and/or assignments.**D. Cell phones: Cell phones are to be either turned off or put on vibration mode while in class.**

VITA

Michael North was born in Morehead, Kentucky on October 28, 1965. His family moved to East Lansing, Michigan shortly after his birth where his parents were closely associated with Michigan State University. He attended public school in Michigan until April, 1979, when his family moved to Champaign-Urbana, Illinois. Upon graduation from Centennial Highschool in Champaign, he attended the University of Iowa from August, 1984 to May, 1988. After leaving the University of Iowa for a year to work as a pipeline welder's apprentice, he returned to complete his Bachelor of Arts in English in May, 1989. In 1990, he began a Master's program in Higher Education at the University of Iowa. He then transferred to the College Student Personnel program at the University of Tennessee, Knoxville in August, 1991 and completed his Master's degree in May, 1993.

In September, 1993 he secured a position as a counselor at Pellissippi State Technical Community College. Taking additional graduate coursework in counseling and psychology at the University of Tennessee, Knoxville since his employment at Pellissippi State, he began pursuit of the Doctorate of Education in Educational Administration and Policy Studies in August, 1998. The doctoral degree was received in August, 2005. He is presently living with his wife, Cindy, who is preparing for a career in social work, in Knoxville, Tennessee. He has recently accepted a position as an Assistant Dean at Pellissippi State.

The researcher's chosen topic of student experiences with online study emerged from repeated, direct work with students at Pellissippi State. In 1995, shortly after Pellissippi State began offering online courses, the researcher noticed a variety of reactions among student advisees when they were presented with the opportunity to study online. Since that

time, the researcher has pursued this interest in why students perceive online study in different ways. Prior to entering doctoral study, coursework in psychological measurement permitted the researcher to design a quantitative scale that attempted to assess individual “openness” to online study. During doctoral study, the researcher’s comprehensive examination allowed for a re-examination of this scale’s design. Doctoral coursework permitted a pilot case study of online and lecture-discussion students in preparation for this dissertation study. This study, therefore, is a culmination of wanting to know more about what students experience when they study online with an understanding that the conveyance of those experiences can be most appropriately derived directly from students.

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