

2005

Designing online instruction for postsecondary students with learning disabilities

Andrew Patrick Simoncelli

Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_dissertations



Part of the [Education Commons](#)

Recommended Citation

Simoncelli, Andrew Patrick, "Designing online instruction for postsecondary students with learning disabilities" (2005). *LSU Doctoral Dissertations*. 1316.

https://digitalcommons.lsu.edu/gradschool_dissertations/1316

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Doctoral Dissertations by an authorized graduate school editor of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

DESIGNING ONLINE INSTRUCTION FOR POSTSECONDARY STUDENTS WITH
LEARNING DISABILITIES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Educational Leadership, Research, and Counseling

by

Andrew Patrick Simoncelli
B.A., Nicholls State University, 1994
M.Ed., Northwestern State University, 2001

December, 2005

TABLE OF CONTENTS

LIST OF TABLES.....	iv
LIST OF FIGURES.....	v
ABSTRACT.....	vi
CHAPTER ONE. INTRODUCTION.....	1
1.1 Definition of Learning Disability.....	2
1.2 Synopsis of Research	3
1.3 Gaps in the Literature.....	10
1.4 Statement of Problem.....	11
1.5 Research Questions.....	14
1.6 Significance and Implications of Study.....	15
1.7 Limitations.....	15
CHAPTER TWO. LITERATURE REVIEW	17
2.1 Transition Between High School and College.....	18
2.2 Learning Strategies of Students with LD.....	21
2.3 Educational Technology and Students with LD.....	24
2.4 Online Learning.....	28
2.5 Assistive Technology.....	37
2.6 Conclusion.....	40
CHAPTER THREE. METHODOLOGY	41
3.1 Design.....	41
3.2 Data Collection.....	42
3.3 Location.....	45
3.4 Participants.....	46
3.5 Procedures.....	48
3.6 Course Design.....	49
3.7 Blackboard.....	55
3.8 Course Instructor.....	57
3.9 Credibility and Confirmability.....	59
3.10 Data Analysis.....	62
3.11 Researcher’s Role.....	63
3.12 Materials Used.....	64
3.13 Timeline.....	65
CHAPTER FOUR. PRESENTATION OF INDIVIDUAL CASES.....	66
4.1 Chance Simon.....	66
4.2 Kathy Deppen.....	72
4.3 Jordan Bourgeois.....	77

4.4 Taylor Harrington.....	80
4.5 Sarah Pierce.....	84
4.6 Justin Landry.....	87
CHAPTER FIVE. FINDINGS.....	89
5.1 Online Course Delivery Methods and Student Efficacy.....	90
5.2 Students' Feelings Towards the Online Learning Format.....	93
5.3 The Students' Involvement in the Online Learning Process.....	96
5.4 The Isolation Factors in the Online Learning Environment.....	98
5.5 The Clarity of the Online Instruction.....	102
5.6 The Time Spent Due to the Online Learning Format.....	104
5.7 Satisfaction of Performance.....	106
5.8 Media Findings.....	109
5.8.1 Weekly Assessments.....	109
5.8.2 Calendar/Task.....	111
5.8.3 Audio Lectures.....	112
5.8.4 Discussion Board.....	113
5.8.5 Text-to-Speech Software.....	116
5.8.6 Fonts and Contrasting Colors.....	117
5.8.7 Technology Problems.....	117
5.9 Online vs. Traditional Instruction.....	119
CHAPTER SIX. DISCUSSION.....	123
6.1 Media Debate.....	123
6.2 Online Learning vs. On Campus Learning.....	126
6.3 Attitude and Achievement.....	129
6.4 Recommendations for Future Online Course Designers.....	130
6.5 Universal Design for Learning.....	134
6.6 Conclusion.....	136
REFERENCES.....	139
APPENDIX A. CONSENT FORM.....	147
APPENDIX B. INTERVIEW PROTOCOL #1.....	148
APPENDIX C. INTERVIEW PROTOCOL #2.....	149
APPENDIX D. INTERVIEW PROTOCOL #3.....	150
VITA.....	152

LIST OF TABLES

Table 3.1	Method Strategies for Media-enhanced Online Course.....	49
Table 4.1	Comparison of Research Participant.....	66
Table 5.1	Student Academic Performance Comparison.....	89
Table 5.2	Discussion Board Postings of Participants.....	99
Table 5.3	Media-enhanced Course Methodology Components.....	109
Table 5.4	Rubric of Course Assessments.....	111
Table 5.5	Discussion Board Usage.....	115

LIST OF FIGURES

Figure 2.1	Projected Internet Usage in the United States.....	31
Figure 2.2	Expected World Internet Growth (1998-2003).....	31
Figure 3.1	History of Western Civilization Main Blackboard Page.....	56
Figure 3.2	History of Western Civilization Course Documents Page on Blackboard.....	57

ABSTRACT

This case study investigates the methodologies used to deliver online course content to postsecondary students with varying learning disabilities. The research provides a holistic picture of the students in their actual learning environment. Two college students diagnosed as learning disabled were studied with three non-disabled classmates in an online college learning environment. The purpose was to attempt to explain how the design of the course affects the students' attitudes and performance. The design of the course featured instructional methods that research has shown to be beneficial to students with learning disabilities. Some of these included digitally delivered instructional audio, various textual interactions between the students, and other assistive methodologies. The college level world history course for this study was taught via the World Wide Web through the Blackboard course management system. Interviews, observations, and academic documents were used to provide a complex, holistic picture of the learning experience of the students in this study. The course for this study was a traditional online course taught during the summer 2005 semester. The content and assessments for the students were the same as in previous offerings of the course and were identical for all students.

The results provide an insight into the impact that these online instructional methods have on the students' attitudes and learning strategies. The intention of this study was not to provide definitive answers to the problems that face students with learning disabilities in postsecondary education, but rather contribute to the body of knowledge of this sometimes overlooked element of academia. The results help explain the behavior of the participants of this study and how they reacted to the online environment in which they were placed.

CHAPTER ONE. INTRODUCTION

Linguists believe that the spoken word is 50,000 to 100,000 years old. But the written word and therefore the possibility of reading has probably been around for no more than 5,000 years. “That’s not enough time for our brains to evolve certain regions for just that purpose. We’re probably using a whole network of areas in the brain that were originally designed to do something slightly different.”
Guinevere Eden, Georgetown University as cited in Time Magazine on July 28th, 2003 (Gorman, 2003 p. 55-56).

Students with learning disabilities (LD) are entering institutions of postsecondary education in record numbers. The number of full-time first year college students who reported a learning disability more than doubled between 1985 and 1996 (Kavale & Forness, 1996). Unfortunately few studies have been able to provide an accurate number of college students with LD because not all students are diagnosed and detection is not obvious as with severe LD and physical disabilities. Some studies have placed the number of incoming college freshman with learning disabilities to be somewhere between .5% to almost 10% (Vogel et al., 1998).

Despite the growing number of students with LD enrolling in postsecondary education, a majority of them are still failing to graduate and are falling behind their non-disabled classmates in the area of academics (US Department of Education, 2000). This study details some of the reasons for these academic troubles and provides possible solutions for solving these problems.

Another area of academics that has increased dramatically over the past decade is the presence of instructional technology and distance learning. With the advancement of the microchip and the personal computer, technology has taken on an ever-increasing role in the education of today’s learners. These technologies are reaching out to all learners including those with learning disabilities. Do these instructional technologies and new delivery methods have an effect on traditional student achievement? Studies on distance learning show “no significant results” (Russell, 2002). However, studies have shown that the use of technology does provide

some benefits in achievement for students with learning disabilities (Ryba, Selby, & Nolan, 1995; Anderson-Inman, Knox-Quin, & Symanski, 1996; Raskind & Higgins, 1998; Bricout, 2001; Berger, 2003). The majority of the studies on instructional technology dealing with students with LD involve assistive technology, student independence, self-efficacy, and drill and practice instruction. Limited research has been done on the area of postsecondary students with LD in the online learning environment (Gardner & Wissick, 2002). And despite the overwhelming presence of technology in academia today, very little research has been conducted that focuses on student satisfaction and their perceptions of the effectiveness of the delivery methods based on their learning experiences (Parkinson, Greene, Kim, & Marioni, 2003).

1.1 Definition of Learning Disability

The identification of students with learning disabilities is not an area in which most educators are familiar. These learners are of average intelligence (based on IQ scores) and “blend in” with the student population of most institutions of academia. Adding more to the confusion is the definition of a learning disability, which varies depending on the source attempting to define it.

Kavale & Forness (1996) analyzed several of these definitions and found the following passages to be included in the majority of the literature:

- A disorder in the psychological processes that is involved in learning, perceiving, understanding, and conceptual understanding
- Deficits in attention, reasoning, memory processing, communication, reading, writing, spelling, calculation, coordination, social competence, and emotional maturity
- Perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia

- The problem is intrinsic to the individual
- The existence of a severe discrepancy between intellectual potential and academic achievement

These various definitions make diagnosing and providing for students with disabilities a difficult task for academic institutions. One thing that must be remembered by everyone involved with educating a student with LD is that the cognitive learning problem cannot be solved, but with the right support and instruction it can be minimized to provide proper learning (Bisagno & Haven, 2002).

For the purpose of this study, I will use the formal definition adopted by the National Joint Committee for Learning Disabilities in 1981:

Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous dysfunction (National Joint Committee on Learning Disabilities, 1987, p.107).

This study provides the current research on the following topics: the transition problems that students with LD have in going from high school to college; the benefits that the World Wide Web has shown to have on students; studies done to show the relations of students with LD and instructional technology; the learning strategies of students with LD; and the gaps in the literature between online learning and students with learning disabilities.

1.2 Synopsis of Research

One of the problems that educators face in providing services to students with learning disabilities in postsecondary education is the vagueness in the federal regulations. Section 504 of

the Rehabilitation Act (1973) requires that public school districts must provide proper services to disabled students in the K-12 environment. However, postsecondary institutions are not covered directly by this requirement. Schools of higher education are required in Section 504 and in the American with Disabilities Act (ADA) to make “reasonable modifications to policies, practices, and procedures where necessary to avoid discrimination, unless they can demonstrate that doing so would fundamentally alter the nature of the service, program, or activity being provided.” The “reasonable accommodations” described in Section 504 and the ADA have been debated and argued in court (*Guckenberger v. Boston College, 1997*) and remain left up to individual schools and eventually courts to decide when reasonable accommodations interfere with academic freedom.

Federal legislation requires that students with disabilities receive services to assist them in the transition from high school to postsecondary life. These transition services must address students’ understanding of their disability, learning strengths and weaknesses, career decision-making skills, and preparation for the increased demands of postsecondary education (Janiga & Costenbader, 2002). The pressure of providing this service is put solely on the duties of the high schools and not the postsecondary schools in which the students will be enrolling.

The lack of effective transition planning may result in inadequate postsecondary adjustment problems (Cummings, Maddux, & Casey, 2000). One study done to determine the effects of these secondary to postsecondary transitions found that students with LD were reporting significantly poorer self-esteem, academic adjustment, and personal-emotional adjustment than their non-disabled peers (Saracogla, Minden, & Wilchesky, 1989).

Some problems that students with LD face in the transition between secondary and postsecondary education include less student-teacher contact and larger class sizes (Lerner,

1997). College courses usually require long-range projects and infrequent evaluations in contrast to the short-term assignments and frequent grading experiences in high school (Janiga & Costenbader, 2002). These various instructional strategies cause difficulties to students with LD because of their learning strategies and short attention spans.

Over the past few decades the world has been going through a transformation into the computer age. Technology and the microcomputer are affecting the way in which people live, the way in which people interact, and the way in which people learn. According to some industry estimates, the number of Internet users worldwide will pass the one billion mark by 2005 (United States Internet Council, 2000). In the United States, 97% of full-time faculty in postsecondary institutions has access to the Internet, and 40% use the Web to post course-related information (US Department of Education, 2001). These numbers are only likely to increase as technology gets more prevalent and inexpensive. According to the U.S. Department of Education over three million postsecondary students were enrolled in online courses in the 2000-2001 school year (National Center for Educational Statistics, 2004), with the e-learning market expected to surpass the 23 billion dollar mark by 2004 (IDC, 2001).

Research on the topic of online learning has caused debate amongst educators as to the overall effectiveness of the technology. Some view the media as a mere vehicle for transferring content from instructor to learner (Clark, 1983) or as a means of disembodiment for the remote students (Dreyfus, 2001). Others feel that this technology will never go away and that educators and instructional designers need to improve the interface-technology infrastructure in order to ensure that the technology is being used most effectively (Meyen et al., 2002). These researchers feel that learning can be enhanced by studying the types of learner interface, instructional design, instructional environments, and other variables that have an impact on student learning.

Both sides of the media versus methodology debate agree that the use of instructional technology and the Internet can have positive impacts on learning if used correctly. The flexibility of media allows for the use to support both the cognitive and social processing of learners (Smith and Dillion, 1999). Additional researchers (Pea & Roschelle, 1999) have noted that the Internet can improve learning in three ways:

- By appealing to the learning styles of students, presumably increasing their motivation to learn
- By offering greater convenience through asynchronous communication
- By providing a fertile ground for developing higher order thinking skills which are required to overcome the general lack of organization of knowledge on the Web (p.23)

Computers and instructional technology have also been shown to have a positive impact on students with disabilities. Sandy Berger (2003) believes that computers have had a tremendous effect on individuals with disabilities in providing a liberating effect, “Computers have completely changed the quality of life and have become a primary source of assistance for the disabled.” (p.1)

The majority of research that has been done on the role that technology has played in educating students with LD has been conducted in the area of assistive technology. These technologies can range from low tech, such as a grip for a pencil (Learning Disabilities Association of America, 1995) to high tech, such as instructional software (Behrmann, 1994). Due to the specifics of this particular research project, only a few of these studies are included in this paper. Since assistive technologies can come in all forms for different applications, only studies that can relate to the online learning environment are mentioned in this paper. Assistive

technology, for these purposes, is for an individual's personal enhancement and does not affect the methodology of the instructor delivering the message. Assistive technologies vary from student to student, and the delivery methods of online courses cannot account for all of these particular needs. Online instructors should attempt to make their materials accessible to everyone rather than predict these individual needs.

One early study conducted to test the impact that word processors had on writing performances of college students with LD (Collins, 1990) found that the word processor helped the students complete the course at a rate similar to that of the non-disabled peers. The use of this technology also allowed the students with LD to achieve grades comparable to their non-disabled peers, improve their writing fluency, and reduce writing anxiety.

A three-year study by Raskind and Higgins (1999) produced positive results in the areas of student achievement, retention, and motivation. The study followed college students with dyslexia taking part in a reading program using simple assistive technology. At the completion of the study, participants significantly increased their grade point averages (GPA) for courses with heavy reading requirements, had an attrition rate of 1.4% compared to the 34% of the control group, had a first time passage rate of 95% compared to 50% of the control group, and had a 78% increase in time using the technology in general.

Another study (Cohen, 1992) showed that the use of a self-paced educational software package produced positive results in the academic performance and self-esteem of students at a community college. The study mentioned how one student who had failed a standardized exam in previous attempts was able to pass the test upon completion of one semester with the program.

While most research has been conducted to determine the effects of technology versus traditional face-to-face instruction, little research has been done to explore two separately

designed courses delivered through similar media. One such study examined whether a teacher-paced video or a student-paced computer accommodation provided differential benefits to students with disabilities (Hollenback et al., 2000). Results of this extensive study found that all students produced significantly higher scores in the student-paced course compared to the teacher-paced video. These results lend more to the discussion of media versus methodology, which is the research foundation of this study.

Some researchers have suggested ways in which online learning can be structured to match the needs of students with LD. Gardner and Wissick (2002) noted that Internet activities for students with LD should include consideration of the structure of the learning, the amount of guidance the learner will receive, the activities that emphasize higher order thinking skills, and the interactivity of sites used.

In order for online teachers and instructional designers to properly develop courses that fit the needs of all students (with or without LD), these educators must first determine what learning strategies these students most often display and how they can be most effectively reached through an Internet based course. An individual's learning style preference can influence the effectiveness of pedagogical material, delivery, and methods (Logan & Thomas, 2002). Erica Kolatch of the University of Maryland (2000) lists the following guidelines in which instructional designers can provide for cognitively disabled learners:

- Support for text browsers on the World Wide Web (WWW)
- Alternate methods for on-line forms
- Information layouts that are consistent and easy to understand
- Simplified and consistent design and presentation (p. 3)

Other techniques that have been synthesized in the literature (Bisagno & Haven, 2002 and Mull & Sitlington, 2003) for ways that technology can be used to effectively reach the learning strategies of students with LD included:

- Obtain e-text versions of books
- Screen enlargement
- Change text colors, highlight words
- Provide both visual and aural presentation of the material
- Provide organizational areas i.e. calendar, task list, address book

A study comparing 191 college students with learning disabilities and students with no disabilities found differences in problem areas and learning strategies (Heinman and Precel, 2003). This research found that students with LD had significantly greater problems with writing, had a greater understanding with oral explanations, and concentrated better in a quiet environment. These are just a few of the areas that instructional designers will have to consider in developing instruction, whether online or in a classroom setting.

Another study (Ruhl & Suritsky, 1995) found that students with reading related LD have trouble taking notes, grouping material effectively, understanding and processing auditory information, difficulty with handwriting and spelling, and maintaining attention. Without properly fitted instruction, these students are typically forced to develop creative strategies to compensate for their weaknesses. Some of these strategies that students with LD have developed involve time management, monitoring activities, memory strategies, chunking information into smaller units of mastery, and using computers (Reis, McGuire, & Neu, 2000).

Other studies have found that computer-assisted practice on visual word recognition improved the performance of students with LD on word reading compared to the control group

(Jimenez, Ortiz, Rodrigo, Hernandez-Valle, Ramirez, Estevez, O'Shanahan, & Trabaue, 2003) and the implementation of technical approaches significantly increased the comparative grade levels in students with LD using the World Wide Web (Kelly, 2000).

Two important areas in which research has proven technology can reduce learning difficulties in students with LD is in providing confidence and independence. Students with LD often struggle in a typical classroom setting and are too shy to speak during class time. Many adults with LD choose to avoid social situations because of inaccurate self-assessments of their social competence rather than their actual social abilities (Gregg & Ferri, 1998).

The use of computer technology and the asynchronous nature of the Internet have provided an independent outlet for these students. Studies have shown that students with LD have an increased willingness to self-disclose online (Bricout, 2001). The computer has brought about the benefit of independence to students where the individual can learn at her or his own pace (Berger, 2003). This independence has been observed through numerous cases where cognitively disabled students have improved their language skills through word recognition programs in multimedia format. Ryba, Selby, and Nolan (1995) noticed that the students gained confidence in their skills since the program allows them to correct their own mistakes and reinforce their self-esteem. This study noted that computers free a person with disabilities from relying on others for assistance.

1.3 Gaps in the Literature

Studies have shown that more and more students with LD are pursuing postsecondary educations than ever before (Kavale & Forness, 1996). In addition, more and more students in postsecondary education are receiving instruction via the Internet than ever before (Meister, 2000). Instructional technology has been noted in several studies to produce positive effects in

students with learning disabilities in achieving student success, confidence, independence, and higher retention rates. (Kelly, 2000; Mull & Sitlington, 2003; Jimenez et al., 2003). However a paucity of research has been done on the effects that online education has on students with disabilities and the methodologies used in delivering these courses.

This research does not focus solely on the technology in an online environment versus the lack of Internet-based instruction in the traditional face-to-face environment. In addition, as Smith and Dillon (1999) suggest, it examines the “different uses of delivery systems and media through different methods that can be used to support cognitive processing in different ways.” (p. 9) The purpose of this study is to examine the relationship between the various online teaching methodologies and the attitudes and achievement of postsecondary students with learning disabilities and their non-disabled classmates.

1.4 Statement of Problem

As mentioned earlier, students with reported learning disabilities are choosing to pursue postsecondary educations in greater numbers than ever before. The number of these students enrolling in universities and community colleges has risen dramatically in the past decade (Vogel, et al., 1998) for various reasons including: increased assistance in high school, passage of federal legislation demanding equal access, and an increase in preparation of students with LD for education beyond high school. Despite the increased presence of students with LD in postsecondary education, the majority of them are still falling behind their non-disabled peers in academic achievement and graduation rates. Wagner, Newman, and Blackorby (as presented by Vogel, et al., 1998) reported that 3 to 5 years after exiting high school, only 30% of the students identified with LD in the nation had enrolled in postsecondary education, and only one-half percent had completed a program or earned a degree.

In addition, secondary students with learning disabilities are more likely than their non-disabled classmates to fail or drop out of school. Reported drop out rates for these students have ranged from 28% to 56% (Cummings, Maddux, & Casey, 2000). A longitudinal study done by the U.S. Department of Education (2000) found a group of postsecondary students with disabilities attained their degrees about 54% of the time compared to 64% for their non-disabled peers within six years of enrollment. Other studies have shown even more discouraging results. Murray et al. (2000) determined the graduation rate of college students with LD was only 3.6% compared with 62.1% for students without disabilities.

The reasons for these struggles can be attributed to the combination of LD learning strategies and the design of college courses. Levinson and Ohler (1998) list some examples of the difficulties that these students have between high school and colleges such as class meeting times, class sizes, study requirements, testing approaches, grading methods, and teaching strategies. Most college courses transmit content primarily through reading and lecture. These methods, combined with the learning strategies of students with LD, create barriers to learning in the postsecondary setting (Ruzic, 2001). Heiman and Precel (2003) list some additional struggles that students with LD have in postsecondary education:

- Difficulty handling academic demands
- Adjusting to change
- Dealing with criticism
- Adjusting to university life
- Experiencing higher levels of anxiety
- Having lower self-efficacy
- Having a lack of self-confidence, self-doubt, and extreme self-criticism (p. 249)

One individual with LD described the nightmare that he faced in transferring from high school to the postsecondary academic and social lifestyle (Cohn, 1998).

When these students enter college they are not only beginning an unexplored and unfamiliar way of life, but embarking on a journey that threatens their established motivational drive, need for order, compensatory skills, and social relationships. It is no wonder that so many students with LD suffer from emotional and physiological problems at the college level. (p. 514)

One of the outcomes that the poor academic achievement and dropout rates have on students with LD in postsecondary education is the difficulty in finding employment. In the work environment, individuals with disabilities are often faced with high unemployment, low pay, part-time work, frequent job changes, non-engagement with the community, limitations in independent functioning, and limited social lives (Patton & Holloway, 1992). Likewise, persons with learning disabilities who graduate from college are much more likely to hold professional and managerial positions than persons with learning disabilities who only graduate from high school (Rogan & Hartman, 1990). The importance of postsecondary schooling to the successful adult functioning of persons with learning disabilities was also noted in other by Gerber, Ginsberg, and Reiff, 1992.

Problems with previous research have been the nebulous nature of these studies and the lack of statistical significance in the results. This study will provide an in-depth qualitative look at the participants and the learning context. Saba (2000) likens this type of research to quantitative ones because research based on learner satisfaction is grounded in theoretical foundations of the field, which is lacking in comparative studies. Qualitative research in the

online learning environment bypasses many methodological and theoretical limitations of the physical science view of distance education.

1.5 Research Questions

This research investigates the relations that various online instructional methodologies have on postsecondary students with LD. The research attempts to suggest ways in which a combination of instructional strategies and delivery media can help produce the desired learning outcome for these students.

The Central Question for this study was: What are the students' perceptions to their online learning experience in relationship to their academic performance?

While this central question guided the research, many other factors were studied that are involved in the different instructional strategies.

Sub Question #1: How did the online course delivery methods affect the students' efficacy?

Sub Question #2: How did the online learning format affect the students' feelings towards the course?

Sub Question #3: How did the students' involvement in the learning change during the online learning experiences?

Sub Question #4: What isolation factors, if any, did the students experience in the online learning environment?

Sub Question #5: How clear and understandable was the instruction delivered in the online learning environment?

Sub Question #6: How did the online learning format affect the time the students spent on the course?

Sub Question #7: Were the students satisfied with their performance in the online learning environment?

1.6 Significance and Implications of Study

Online methodologies can be designed to increase the academic learning and improve the attitudes in postsecondary students with learning disabilities. This research studies an important and steadily increasing student population in postsecondary education. The implications of the study make suggestions towards assisting students with learning disabilities in the online learning environment. Results can help lead to increased learning, increased graduation rates, improved standardized test scores, and better employment in students with LD. The purpose of the case study is not to provide definitive answers, but to allow for the inclusion of contextual conditions, as variables, that may be highly pertinent to the study's findings (Yin, 1994).

Online learning on college campuses is growing at large rates (NCES, 2003). The design of these courses is still in the infancy stage when compared to the traditional classroom setting, which has been around for thousands of years. This study will look into how different instructional strategies available to the online learning environment affect attitudes and achievement in these courses. The results will aid online instructional designers to better improve these courses for the growing number of online students with learning disabilities.

1.7 Limitations

Critics of the case study claim that this type of qualitative research limits the generalizability of its findings. Although this can be stated about all types of non-quantitative studies, the purpose of this research is to provide an in-depth analysis of this bounded system between students with learning disabilities and the online learning environment. The purpose is

to put a face on the research question and not a number. The participants in this study provided enough detailed information to be able to generalize the findings to similar situations.

The different instructional techniques that made up the procedures involved in teaching this course are defined and itemized in Chapter Three. Breakdowns of the methods and multimedia used was determined by the researcher and course instructor and expanded upon before instruction begins. In addition, the use of the qualitative case study is meant to paint a holistic picture of the particular case and not generalize the results to the wider population. In this research, five individuals were studied in-depth, but the results are not intended to be generalized to all students in the online learning environment.

CHAPTER TWO. LITERATURE REVIEW

Granted that, insofar as education consists in sending facts from someone who has a lot of information to those who don't have it, the Web works well, but so would videotapes or any recording medium. There must be something more than information-consumption going on in distance learning or there is no point in adding the Internet to the canned lecture (Dreyfus, 2001 p. 31).

Instructional use of the Internet in the academic community has only been used extensively in recent years. In addition federal regulation that requires certain agencies to make accommodations for individuals with learning disabilities has only been strictly enforced with civil rights legislation since the early 1990's with the development of the Americans with Disabilities Act (ADA), Section 504 of the Rehabilitation Act, and the Individuals with Disabilities in Education Act (IDEA). Due to the limited timeline of these two areas, limited research has been conducted on the effects that the Internet and online learning have on students with learning disabilities. Few studies have combined the two areas to determine how students with LD can effectively learn through the online medium.

Despite the lack of studies combining these two constructs, numerous studies have been conducted on the impact that technology has played on students with LD (Kelly, 2000; Mull & Sitlington, 2003; Jimenez et al., 2003). Research shows how computer based technology can produce positive effects on students with LD if used properly.

The problem identified in this study deals with the difficulties that students with LD have in adapting to postsecondary life and postsecondary instruction. Research has been done that identifies some of the adjustments students can make in the transition between high school and college to make the change easier for these students (Saracoglu, Minden, Wilchesky, 1989; Janiga & Costenbader, 2002). These transitions involve several facets such as academic, social, and personal issues that students with LD must confront.

Some of the problems with these transitions have been caused in part due to the learning strategies students with LD use including study strategies, cognitive/learning strategies, compensatory supports, environmental accommodations, self advocacy, and the development of individual plans (Reis, McGuire, & Neu, 2000). These strategies for learning should be considered in developing online instruction for students with LD. The learning strategies of students with LD have been investigated in several studies (Hollenbeck, Rozek-Tedesco, Tindal, & Glasgow, 2000; Ruzic, 2001; Heinman & Prechel, 2003).

Although limited research has been done concerning e-learning and students with LD, numerous studies have been done concerning e-learning and the general student population (Rose, 1994; Eustace et al., 1994; Brown, 1997; Silc, 1998; Doyle, 1999; Pea & Roschelle, 1999). The results of these studies will help determine what types of methodology have proven to be effective in delivering course content through the online medium.

The last body of research that will be discussed will be in the area of assistive technology. Assistive, or adaptive, technology is devices that aid students with disabilities in their learning. A vast body of research has been conducted on assistive technology that show the technology produces positive results in students with disabilities (Raskind & Higgins, 1998; Bisagno & Haven, 2002). Since assistive technology can come in various forms, even the computer and the Internet could be considered assistive devices.

2.1 Transition between High School and College

The literature has shown that students with LD perform below their non-disabled classmates when it comes to student achievement. The academic struggles of students with LD are even more magnified when it comes to learning in the postsecondary setting (Cummings, Maddux, & Casey, 2000; Murray et al., 2000). The reasons for these difficulties range from an

unclear federal mandate (IDEA, 1990), the lack of effective transition planning may result in inadequate postsecondary adjustment problems (Cummings, Maddux, & Casey, 2000), less student-teacher contact and larger class sizes (Lerner, 1997), and the long-range project requirements of college courses that produce infrequent evaluations, in contrast to the short-term assignments and frequent grading experiences in high school (Janiga & Costenbader, 2002). In addition, the identification of students with LD needing services in higher education is more difficult because providers are dependent on the students to self-identify that they have a disability and request academic accommodation (Mott, 2003).

Under the Individual with Disabilities Act (IDEA) of 1990 and its subsequent amendments of 1997, high schools are required to provide transition services based upon the individual student's needs (Individuals with Disabilities in Education Act of 1990, Section 602(a), 20 U.S.C 1401a). The IDEA and its amendments specify that schools provide an Individual Educational Program (IEP) to students with LD indicating the transition needs of these students and a plan on which these needs will be met. Lack of effective transition planning may result in inadequate postsecondary adjustment problems (e.g. under- or unemployment, restricted participation in community and leisure activities) (Cummings, Maddux, & Casey, 2000).

One study surveyed coordinators of special services for students with disabilities at 74 colleges and universities in New York State to determine the effectiveness of these transitional plans (Janiga & Costenbader, 2002). The results of this survey determined that there was little satisfaction in the transitional services for students with LD. Results were based on a five point Likert Scale (5 being the most satisfied, 1 being the least satisfied). The areas that were

determined to produce the lowest satisfaction to the special service coordinators were on the following three questions:

- The students and parents whom we serve are properly informed of the services available to them through VESID (a New York state program that provides assistance and services to individuals with disabilities ($\mu=2.51$))
- Many students who would benefit from our services do not seek out our assistance ($\mu =2.39$)
- The students with learning disabilities whom we serve were adequately prepared in junior and senior high school to advocate for themselves in college ($\mu = 2.18$) (p. 467)

One study was conducted to determine the personal problems that students with LD reported in the postsecondary environment (Saracoglu, Minden, & Wilcesky, 1989). In this study, 34 university students with LD were surveyed to assess the students' adjustment to various facets of the university experience such as academic, social, and personal-emotional adjustment to university. Statistical results of these surveys showed significant differences in three areas for the students with LD compared to a control group of students without LD. The college students with LD scored significantly lower than their non-LD counterparts in the area of self-esteem ($f=7.19$), personal-emotional ($f=6.88$), and academic adjustment ($f=5.43$). Saracoglu, Minden, & Wilcesky state the results of these findings support the need for special services for students with LD at the postsecondary level. (p. 592)

Students with LD also list alienation as a coping strategy with life in postsecondary education. One study reviewed the social participation skills of college students with LD (Gregg, Hoy, King, Moreland, Jagota, & Nemanti, 1992 as reported in Gregg and Ferri, 1998). The

results of this study showed that many adults with LD chose to avoid social situations because of inaccurate self-assessments of their social competence rather than their actual social abilities.

2.2 Learning Strategies of Students with LD

Some students with learning disabilities do succeed in postsecondary education despite the typical transitional difficulties. One study (Reis, McGuire, & Neu, 2000) interviewed and surveyed some of these students to determine the compensation strategies that produced their positive results. These compensation strategies included such areas as study strategies, cognitive/learning strategies, compensatory supports, environmental accommodations, opportunities for counseling, self-advocacy, and the development of an individual plan incorporating a focus on metacognition and executive functions. (p. 123)

The researchers in this study (Reis, McGuire, & Neu, 2000) selected 140 university students with LD, who were identified as having academic success in the university setting. The results of the interviews and questionnaires were coded to determine the compensational strategies that these students used to help in their individual achievements. Some of these strategies as identified by the researchers include:

- Test-taking preparation
- Time management
- Monitoring, daily, weekly, and monthly assignments and activities
- Using weekly and monthly organizers to maximize use of time
- Memory strategies such as mnemonics
- Word processing
- Use of computers
- Books on tape (p. 129)

These strategies for effective learning should be considered by instructional designers in postsecondary education, who are asked to develop instruction for students with LD.

Despite these successes, a large portion of students with LD are still struggling to excel in the college setting (Murray et al., 2000). One of the main difficulties that students with LD are having in the transition between high school and postsecondary education is the incongruence of college delivery methods with the students' learning strategies. These delivery methods and learning strategies have been identified in several studies (Hollenbeck, Rozek-Tedesco, Tindal, & Glasgow, 2000; Heinman & Precel, 2003).

Heinman and Precel (2003) studied college students with LD in four areas: academic difficulties, learning strategies, functioning during examinations, and students' perceptions of factors that help or impede their academic success. The researchers in this study surveyed 191 students with LD and 190 students without LD at the Open University of Israel to compare the students' perspectives in the aforementioned areas. Students with LD reported difficulties in humanities or in social sciences because of the heavy reading and writing requirements of these courses.

Heinman and Precel (2003) found that when it came to the area of academic studies, the biggest problems that the student with LD faced compared to the students without disabilities was in the area of writing difficulties ($f(1,379)=31.61$). Several significant differences were determined when it came to the learning strategies of the two groups. The students with LD selected wanting oral explanations more than the students without disabilities ($f(1,379)=23.58$), while the students without LD stated having written examples helped them understand the materials better when compared to the students with LD ($f(1,379)=16.77$). In the area of coping during examinations, students with LD said limited time was a problem more than the students

without LD ($f(1,379)=23.48$), and requested special conditions during examinations more than their non-LD classmates ($f(1,379)=39.37$). In comparing the groups in factors that could facilitate the students' academic success, the results revealed that more students with LD studied with a private teacher ($f(1,379)=7.89$), and preferred tape recorded materials than students without LD ($f(1,379)=8.36$).

Ruzic (2001) conducted a qualitative study to determine the learning strategies of college students with LD in courses that required heavy reading. Ruzic interviewed and observed nine students to determine what strategies were used in the postsecondary setting and compared these results between the successful students versus those who do not perform well academically.

Some of the learning strategies that were identified by the successful students with LD include:

- Develop a plan for effective time management that includes doing a little work each day
- Mix courses that do not require lots of reading
- Take responsibility in learning the material
- Think about what the instructor expects for each assignment or exam
- Match work to assessments
- Modify strategies based on feedback

One study has shown how learning strategies and technology can be used together to increase learning (Hollenbeck, Rozek-Tedesco, Tindal, & Glasgow, 2000). In this study, Hollenbeck, et al. examined whether a teacher-paced video (TPV) accommodation or a student-paced computer (SPC) accommodation provided differential access for students with disabilities in a large-scale math test. Twenty-five seventh grade students were compared in this study along with twenty-five general education students to determine the effect that the delivery method had on both

groups of students. The difference between the two delivery methods was instructional pacing. In the TPV group the pacing was teacher controlled, while the instruction for the SPC group was individually paced. Although the general education students performed significantly better than students with disabilities on both the TPV and the SPC accommodations, the special education students scored significantly higher on the SPC accommodations ($\mu=7.24$) than the TPV environment ($\mu =6.04$). In this study, the special education students statistically preferred the student paced computer method of delivery when compared to the more common teacher paced video instruction method.

2.3 Educational Technology and Students with LD

While the previous study compared two different media and two different instructional methodologies, some studies have shown that technology alone can produce benefits to students with LD in the areas of academic achievement, (Jimenez, Ortiz, Rodrigo, Hernandez-Valle, Ramirez, Estevez, O'Shanahan, & Trabaue, 2003) and confidence and independence (Pedrali and Rossano, 2000). Mull & Sitlington (2003) summarized some of the uses that technology has provided in helping students with LD succeed in postsecondary education settings. Some recommendations noted by the research include:

- Electronic keyboard
- Ability to change text size and background
- Talking and large-print word processors
- Screen enlargement, vary type sizes and fonts
- Change monitor foreground/background color
- Online calendars and planners
- Noise-blocking headset (p.29)

One study showed that using the Internet to provide teacher led lessons is helpful in meeting the needs of students with disabilities (Kelly, 2000). Kelly used the online teacher-created lesson plan software, WebQuest, to address IEP goals and focus on accommodations and modifications to support her students' needs. Kelly's eighth grade students using WebQuest and other technology based approaches produced higher results than the other group of special education students without the use of technology. The class with the technology integration showed an average increase of 2.3 grade levels, while the class without technology showed an increase of only 1.2 grade levels over the same time period.

Positive results were found with a group of fourteen-year-old Spanish children with dyslexia when computer-assisted instruction was used to deliver visual word recognition (Jimenez et al., 2003). This study compared a group of dyslexia students (n=14) and a group of "garden variety" poor readers (n=31) receiving computer-based reading practice versus a control group of students with low reading scores (n=28), who did not receive any computer-assisted practice. The purpose of the study was to determine how computer-assisted instruction affected individuals with dyslexia and typical poor readers in the areas of reading and arithmetic ability. The poor readers were recognized as students without learning disabilities, who were identified by having trouble with reading without an IQ-achievement discrepancy. The learning disabled students in the study had reading disabilities in addition to low IQ scores, which identified them as learning disabled.

The children in the study were given a computer-assisted reading program in which a computer segmented the words into sub word units while a woman's voice was pronouncing them. This program also provided immediate feedback whenever a student required additional information. The feedback was typically in the form of the words being repeated back to the

students in the headphone. This type of immediate, individual feedback is not often found in a non computer assisted classroom due to time restraints and shyness on the part of the disabled student. The students went through fifteen sessions in this program with different reading materials in each session consisting of 40 nouns. The control group received typical face-to-face instruction without the aid of computer technology.

Results of the Jimenez, et al. (2003) study showed that children with reading difficulties, both with dyslexia and those with the “garden variety” reading disabilities, performed significantly better than the control group. The participants who learned through the computer-assisted technology showed significant improvements on word recognition from the pre-test to the post-test, where the control group showed no differences. Results showed that students with dyslexia, who received instruction through the computer-assisted program produced significant improvements from their pretest scores, $f(1,67), p < .001$. However the control group, which received no computer-assisted instruction showed no differences between the pretest and the posttest scores, $f(1,67), p = .10$. Despite the improvements shown when students used the computer-assisted instruction, the researchers provided no reason for the improvements.

Results of studies involving individuals with disabilities illustrate the importance of providing efficacy and confidence to the students. ThinkQuest (2003) stresses the importance of independence and motivation by stating, “The primary goal of treating someone who is mentally handicapped is to develop the person’s potential to its fullest.” As mentioned in Lyman and Mather (1998), Martha Jones, of Bridgewater State College, views the benefits of technology for special needs students as, “resources that make the students more independent and productive, and familiarize them with devices that can be made available in the workplace as cost-effective adaptations their potential employers can invest in.”

One program that is helping students with mild-disabilities academically through the use of enhancement tools and motivation is the Technology-Enhanced Learning Environments on the Web (TELE-Web). TELE-Web is an Internet driven project set up by Michigan State University researchers Carol Sue Englert and Yong Zhao (2001).

The TELE-Web site was set up to provide tools that help students develop performance abilities in reading and writing in addition to independent learning skills. Students who use this site are able to receive cognitive and social support. Students use the TELE software to create and read texts that are in a collective project database on the Internet. TELE students can search the database for information, organize notes into informational structures, publish their notes, comment on other students' notes, and publish reports and stories (Englert and Zhao, 2001). Research from this program has shown that TELE-Web children are more motivated to write and that they are writing longer and more descriptive stories (Warger, 2003).

Additional research has been conducted to determine computer instruction and its effect on mentally disabled students' confidence (Pedrali and Rossano, 2000). One of the goals of this study was to understand the expectation of computer training for young students with LD to recover the confidence of their capacities. Some of the predetermined observations the researchers found in the students included:

- Inexperience in the use of personal computer
- Low abstraction capabilities
- Difficulty faced in problem solving
- Problems in cognitive self-control
- Limits in managing linguistic functions
- Low motivation and self-esteem

- Necessity to avoid playful elements

These limitations are common in students with LD and can sometimes be controlled with proper technology-based instruction. The Pedrali and Rossano (2000) study found the benefits of the technology included the ability to produce an equal oral message for each written message in instruction to aid in visually impaired students and to allow for repetition or duplication of instruction. The use of computer based tools in the study also allowed for the development of problem-solving capabilities that provide independence and confidence in the learning disabled students.

Sometimes the presence of computers alone provides confidence in these learners. Knowing about the computer, but having very little experience with the technology intrigues these learners. Using computers can sometimes make students with LD feel important or as capable as their non-disabled counterparts. Studies (Anderson-Inman, Knox-Quin, & Szymanski, 1996) have found effective ways to help disabled students use computer technology to organize and manage their time, manipulate information in search of patterns and meaning, and study for tests.

The use of computers can also increase confidence in learning disabled students by assisting in their communication process. Some disabled learners, who are shy and introverted around fellow students, can open up and communicate with their peers and teachers through the computer (Ryba, Selby, & Nolan, 1995). Students can use the computer to express their feelings and thoughts that they previously kept to themselves due to shyness and low self-confidence.

2.4 Online Learning

One of the newer and still evolving forms of instructional media is the Internet or World Wide Web. Over 90% of public institutions offer online course, and the enrollments for these

courses continue to grow at rates faster than the overall student body (Allen & Seaman, 2004). This gateway provides the user with access to various services including education. One of the appeals is that its connectivity is mainly transparent to the user. This medium can even allow instructors to be separated from their students geographically. This permits students to learn in a self-paced manner, and they can also learn from other students.

As with any media, there are strengths that can be utilized and exploited when devising instruction for Internet delivery, and there are also pitfalls that must be avoided. Because this is a newer technology for instruction, care must be taken to avoid the pitfalls. Many studies conducted on the effect of technology and distance learning have resulted in no significant differences between the use of media and the traditional face-to-face delivery method (Russell, 2002). Other's ask, "can the bodily presence required for acquiring skills in various domains and or acquiring mastery of one's culture be delivered by the means of the Internet" (Dreyfus, 2001 p.49).

Despite the lack of evidence in academic achievement in distance learning courses, some researchers have indicated several advantages of Internet-based courses (Simonson, Smaldino, Albright, Zvacek, 2003, p.243)

- Students can participate from school, home, office, or community locations.
- Asynchronous course components are available 24-hours a day at the learner's convenience.
- Students can work at their own pace.
- The technology is relatively easy to use.
- The Internet can provide a student-centered learning environment, if the materials and methods are designed to take advantage of the interactivity the Internet provides.

Similarly, limitations have also been noted for Internet-based courses (Simonson, Smaldino, Albright, & Zvacek, 2003, p.244)

- Courses may focus on the technology rather than the content.
- The active learning emphasis of Internet-based courses may be difficult for students conditioned by previous courses to be passive.
- Online courses require students to take more responsibility for their own learning.
- Bandwidth limitations make it difficult to present advanced technologies over the Internet.
- Feedback may be delayed by hours or days in an asynchronous online learning situation.

One of the benefits of the Internet as a delivery medium is its capacity to support aspects of good instruction because of its ability to utilize text, audio, and graphics. The Internet supports knowledge construction by shifting the emphasis onto the learner as the controller and developer of knowledge. According to Doyle's observation (1999), the prospect of Web publishing represents opportunities for growth, self-esteem, and real-world experience for many learners. Students finish assignments within deadlines with real enthusiasm and genuine pride when they know that their articles are to be posted daily on the Internet.

Learners on any computing platform can access the information in Web-based courses. With the availability of Web browsers on virtually all computers, students can work on their coursework from any computer with access to the Internet. Research done by the CommerceNet Research Center and Nielsen Media Research in 1999 cites statistics showing an increase in Internet access in the U.S. through 2005 and worldwide through 2003 (Leib, 1999). (See Figure 2.1 and 2.2)

U.S. Internet usage 1995 - 2005 (% of pop)

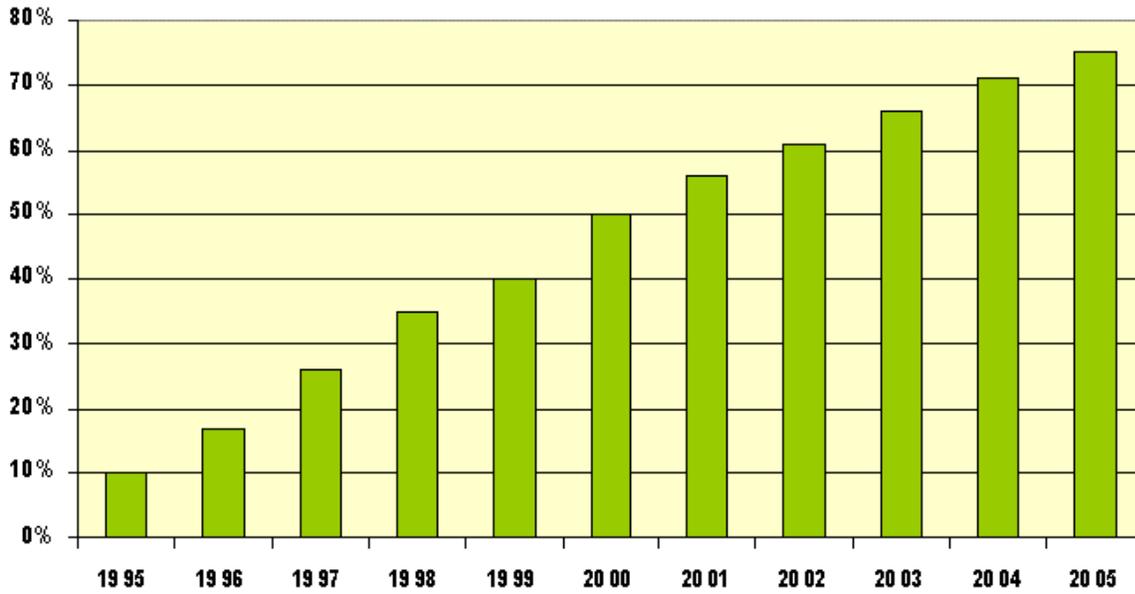


Figure 2.1 Projected Internet Usage in the United States (Copyright © CommerceNet)

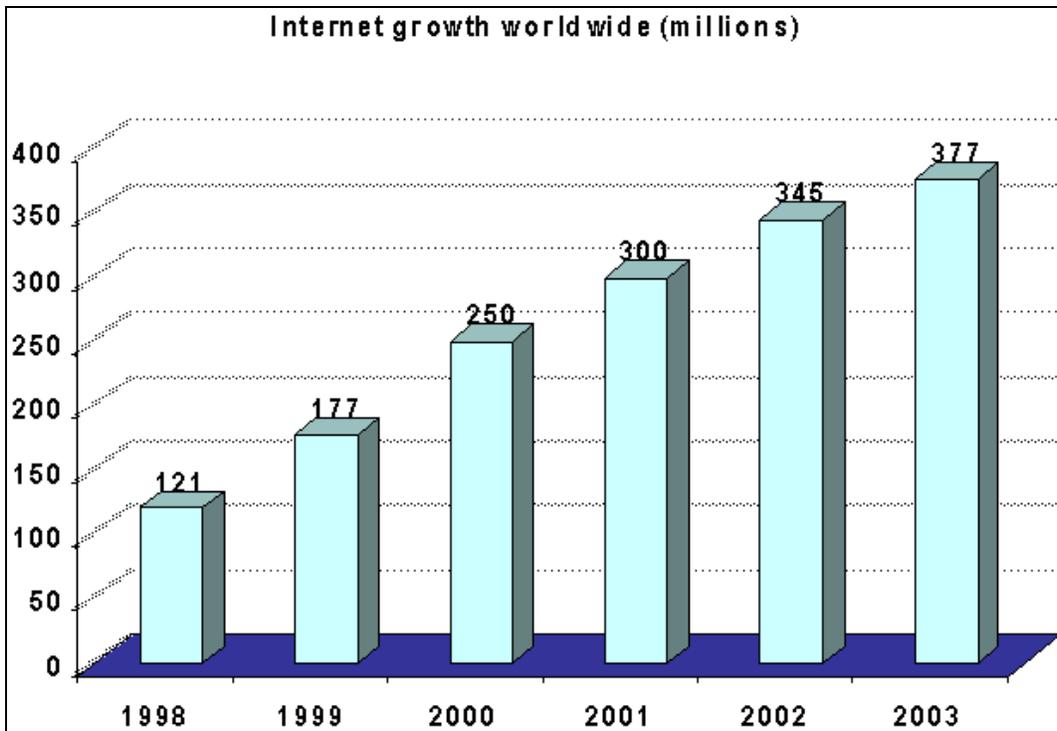


Figure 2.2 Expected World Internet Growth (1998-2003) (Copyright © CommerceNet)

Like all new media that is used to deliver a message, the Internet needs to be used properly in order to produce the greatest results and benefits to the end users. With the online medium only being widespread since the 1991 advent of the World Wide Web, proper methods of delivery are still being discovered and researched. According to Owston (cited in Pea & Roschelle, 1999), the Web can improve learning in three ways:

- By appealing to the learning styles of students, presumably increasing their motivation to learn
- By offering greater convenience through asynchronous communication.
- By providing a fertile ground for developing higher order thinking skills which are required to overcome the general lack of organization of knowledge in the Web (p. 23)

Meyen et al. (2002) went a step further by addressing the needs for conceptual approaches to the design of e-learning. Meyen et al. noted that instructional designers need to consider three variables in building the e-learning construct: outcome, in situ, and independent variables. The outcome variables that the researchers determined should be considered are the variables associated with the consequences of implementing e-learning that can be measured. These dependent variables should not be completely measured by student performance, given the newness of e-learning for pedagogy. (p. 41) Outcomes to be considered by instructional designers should be: academic policy implications, pedagogical effectiveness, economic implications, technology implications, and learner performance.

Meyen et al. (2002) describe the in situ variables as the conditions that surround the educational training experience. (p. 41) Examples of these variables include: learner attributes,

learning environments, nature of content, and technology infrastructure. In situ variables cannot always be controlled by the designers, but should always be considered.

The independent variables mentioned by the researchers include: levels or types of interaction, instructional design, learner interface, and instructional environments. The independent variables can be manipulated by the designers and should be used accordingly with the other two variables.

Meyen et al (2002) stated the combination of these different variables could produce the development of effective online learning constructs, which leads to their idea of the goal of instructional design for online learning, “The ultimate goal is to simulate the development of a systematic approach to researching the many technical and pedagogical elements of effective e-learning instructional environments for all learners, especially those with disabilities”. (p. 44) As the previous statement says, the importance of knowing the characteristics of students with LD is important before designing the proper delivery methodologies.

Everyday, people use the World Wide Web in an open education format to provide them with information, such as data on various car models, which makes them more informed consumers and productive members of society. World Wide Web browsing can allow students to find ‘up-to-the-minute’ information, not readily available elsewhere in journals and textbooks. For instance, it can provide students with information on how to create their own HTML documents, or it may even allow users to visit a virtual art gallery. The World Wide Web, together with other interactive tools, can provide a wider choice of on-line distance education courses and learning experiences for students within the virtual realm of the Internet (Eustace, Fellows, & Tsang, 1994).

The World Wide Web is able to accommodate multiple media into instruction, which allows it to address various learning styles. Learners can have access not only to a wide range of media, but also to a wide range of sources for education.

Through the use of Internet-based courses, database engines can drive Web sites to both provide and collect data from users. The Internet provides a format that allows testing through the use of interactive quizzes. These quizzes can be implemented using various testing techniques to provide immediate feedback to learners. Each test can be unique through the use of back-end engines to provide random question functionality. In addition, the Web offers the ability to survey students through the use of online forms. The database engines can collect the data, which can be plugged into a statistical program to analyze the results.

The ultimate usefulness of Web-based instruction is its ability to allow consistent templates and navigational tools to be used to provide ease of navigation, a sense of human interaction, and helpfulness and responsiveness to the needs of learners studying in an information-rich, self-directed medium. Learners need to feel confident that they know where they are at any point in the course and that they can easily make contact with others as the need arises (Brown, 1997).

Because of the boundless nature of the Internet, Web-based courses can offer an avenue for idea exchange. Students can engage in conversations with experts in the field or with other students. The World Wide Web offers teachers a way to teach our children to be creative problem-solvers and to develop into thinking adults with the potential to be lifelong learners. Some researchers suggest that this responsibility not only lies with teachers and parents, but it also rests in the hands of the larger community to assist in this development. Educational

programs have been experimenting with the notion of using e-mail to allow students to correspond with “experts” as an addition to their classroom experience (Rose, 1994).

Online courses can also be used to support independent learning or learning in cooperation with peers, without direct instructor intervention. Discussion Boards provided a shared space for participants to not only present opinion and pose questions, but also to share pointers to helpful information sources on the topic of interest. The features of Discussion Boards allow class members to build and share in information collection during the course of a class. Everyone in the class can add content to the class by participating in discussions and by providing references to information sources they find helpful.

According to Brown (1997), online discussion has a number of advantages over oral real time discussion. The asynchronous nature of online discussion allows learners to respond at a time that best suits them. It allows students time to reflect on or further research the topic before responding. Brown adds that the physical anonymity of the contributors is a great equalizer. More reclusive learners no longer need to struggle for a 'turn to speak'; they can make a contribution to the discussion whenever they like with the surety that it will be 'heard' by all class members. Brown also argues that it is through the actual process of writing our thoughts and working them over that we really come to understand. The written documentation allows for alteration and promotes self-reflection, and these are central learning strategies for developing an understanding of new concepts. Students should be allowed to choose how much time to give to these activities. Discussion Boards encourage learners to act on the information in some way, such as putting ideas into written form, drawing ideas together and analyzing them, or interacting with others to further develop ideas. These asynchronous forms of communication can aid the shyness in students with LD mentioned in other studies (Ryba, Selby, & Nolan, 1995).

Due to lack of education or other issues, individuals with learning disabilities are falling behind their peers in the post-school workforce and are characterized as unemployed and/or underemployed (Patton & Palloway, 1992). Web-based courses allow a student to use the same types of learning that they will need in today's workplace. Employability skills are the skills needed to find, get, and keep a job. The SCANS Commission (Secretary of Labor's Commission on Achieving Necessary Skills) names the following skills required for effective workplace performance; these involved three foundational skills, which included basic skills, thinking skills, and personal qualities, and five workplace competencies, which included the use of resources, interpersonal skills, information, systems, and technology, for solid workplace performance (U.S. Department of Labor, 1991).

Many of these skills can be tackled by well-designed, Web-based lessons. Students must use problem-solving skills to employ strategies of sifting through the enormous amount of data available online. Learners become familiar with technology as they use the mouse to point and click and navigate from screen to screen. Icons that were once unfamiliar now have meaning that will transfer to a variety of computer applications. As learners type information into online forms, they improve their keyboarding skills (Silc, 1998).

Though these studies have shown that online learning has had a positive impact on student achievement, several others have shown that the medium has "no significant difference" in transferring the knowledge and skills to the remote students. Some educators feel that this does not indicate that the delivery system does not impact learning (Smith & Dillon, 1999). Smith and Dillon state that, "All media and associated delivery systems have unique arrays of characteristics that can support cognitive and social processing in different ways." (p. 20) In addition, the relatively young medium of online learning is already producing similar results to

the more traditional classroom style of delivery, the obvious thinking would be that online learning will produce even greater results once the medium gets researched more and improved upon and different methodologies are practiced.

2.5 Assistive Technology

The computer itself, when compared to other types of instruction, could be considered an assistive technology. Assistive technologies come in different forms today to cover almost every type of disability that students may possess. These include, but are not limited to, difficulties with the written language, oral communication, reading, organization, and psychomotor disabilities. Assistive technology is defined by the Individuals with Disabilities Education Act (IDEA, 1997) as, “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.” These items can be as high-tech or low-tech depending on the severity of the needs.

Lahm and Morrisette, through Behrmann (1994) outline several areas where assistive technology can prove beneficial to disabled students in an academic setting. These areas include organization, note taking, writing assistance, productivity, access to reference materials, cognitive assistance, and materials modification.

One study conducted on the use of assistive technology for postsecondary students with LD was done by Marshall Raskind and Eleanor Higgins (1998). Their study was meant to identify basic models of assistive technology service delivery and specific service and review the effectiveness of these technologies with postsecondary students with learning disabilities.

The three-year study followed one hundred forty students with LD through an assistive technology based training session. These students were compared against a group of students

who did not have access to assistive technology during the period of the study. The results showed that the students with LD using assistive technology significantly increased their GPA's for courses with heavy reading, whereas the matched control group showed no gains. Besides increased GPA's, the students using assistive technology also had higher retention rates than the members of the control group. The university attrition rate of the 140 participants was only 1.4% during the three-year project period compared to 34% for the students with LD who did not participate in the training. In addition, the participants first-time passage rate was 95%, compared to 50% passage rates for both the matched group and the population of the students with LD prior to the study, and 75% overall passage rate for the general population of the University.

The Raskind & Higgins' study (1998) also produced some positive indirect results in their three-year research. The use of assistive technology brought about changes to the participants including a 78% increase in hours of use of assistive technology in general, an increase of 75% of the participants in extending the use of word processors for academic purposes other than note taking, an increase among 90% of the participants in expanding the use of computers into nonacademic settings, and an increase in the use of assistive technologies not utilized in the study (e.g. VHS tape recorders, books on tape).

Questionnaires for the participants also found that the assistive technology proved beneficial to the students' efficacy and independence. Eighty percent of the students related that they felt better about themselves academically through participation with the technology. Nearly half the respondents reported that computers had changed their lives for the better. Nearly a third of the students reported that they "couldn't have made it through" without the help of training on assistive technology. And one third of the students reported alterations of their career goals to

include working with other students with learning disabilities or related difficulties as a result of the study.

The Raskind & Higgins' study (1998) showed that with assistive technology students with LD can produce positive results in a postsecondary setting. Upon completion of the study, the majority of the LD participants were more focused, independent students who were performing better academically than they were prior to the assistive technology program.

Assistive technology is not the stand-alone answer to all of a learning disabled student's problems. Technology that is beneficial to one student with LD may be counterproductive to another student. Hearing software will not help a wheelchair bound student, just as a oversized keyboard will not help a hearing impaired student. Like with all technologies, the key is to find the right support to match the disabled person's needs. All assistive technologies are not meant for every learning disabled student's needs. Sometimes each student needs to have a workstation set up to match his or her particular needs. Bisagno and Haven (2002) list the following six guidelines to consider in providing the proper assistive technology for the learning disabled (LD) student:

1. The learner's type and severity of LD
2. His or her strengths and weaknesses and preferred learning style
3. That academic area impacted by the LD
4. The student's academic major
5. The educational context or learning environment
6. The student's "technology quotient" or ease of comfort with using technology

In addition to determining what type of assistive technology is needed for each individual's needs, educators also have to realize that assistive technology alone cannot solve all

the problems with disabled student's ability to learn. Assistive technology does not try to improve deficits that have shown resistance to remedial approaches, but rather provides a compensatory approach that circumvents or "works around" deficits while capitalizing on strengths (Tools, 2003). Assistive technology can enable or enhance a person's ability to perform basic skills, but it will not cure a mentally disabled person of his or her disability.

2.6 Conclusion

A paucity of research has been conducted between postsecondary students with learning disabilities involved in Internet based learning (Gardner & Wissick, 2002). However the online learning environment has proven to be an effective tool in educating students with similar results of traditional face-to-face instruction (Eustace et al., 1994). While "no significant difference" in student achievement has been determined between the two delivery media, instructional designers can modify their online methodology to better fit the learning strategies of the students with LD (Hollenbeck, Rozek-Tedesco, Tindal, & Glasgow, 2000). These strategies have been identified by several studies (Reis, McGuire, & Neu, 2000; Ruzic 2001). Some of these strategies can be easily adopted and adapted to the asynchronous World Wide Web delivery environment (e.g. time management, organizers, more multi-media).

In addition to these modifications to the methodology, technology alone has proven to provide benefits to students with LD in the areas of academic achievement, self-efficacy, and independence (Kelly, 2000; Mull & Sitlington, 2003; Jimenez et al., 2003).

So while the literature does not indicate successful research in which college students have succeeded academically in the online learning environment, relative studies indicate that technology does provide benefits in other areas that may benefit student performance.

CHAPTER THREE. METHODOLOGY

To espouse that a scientist's perception is never really objective because it is always influenced by past experience and goals, the scientist's top-down process is precisely the result of taking an independent subject as given and then discovering and arguing from a subjective nature of his representations (Varela, Thompson, & Rosch, 1991 p.230).

The world history course that was used in this study incorporated many of the successful findings in the research on students with learning disabilities. The study was a detailed analysis of college students with varying learning disabilities in an online learning environment. The information was gathered from in-depth interviews with participants, course documents, virtual observations, and additional interviews and documentation from the instructor in this course. The course was a prototypical online course using the Blackboard course management system with some additional design methodologies included to fit the learning strategies of post-secondary students with LD. These methodologies will be described in detail below.

3.1 Design

This in-depth data collection of multiple sources of information is described as a case study by Creswell (1998) and Yin (1994). Yin defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p.13). This type of design allows for the inclusion of contextual conditions, as variables, that may be highly pertinent to the study's findings. This differentiates the case study from the objective nature of a quantitative study. The case study design recognizes both the lived experience of the individuals and the context in which these social events occur.

A case study design is recommended to best understand the overall effects of Internet-based learning and how it differs from the traditional classroom method of college instruction.

The primary method of data collection will be through the use of extended interviews with the research participants and the instructor of the course. Qualitative research is intended to gather information in a manner that considers experiences from the participants' perspectives (Bogdan & Biklen, 2003).

3.2 Data Collection

The interviews conducted by the researcher enabled the students to openly share their feelings on their educational experiences. Results were compared, analyzed and combined with observations, course documentation, and interviews from the instructor. This methodology of data collection provided a more in-depth aspect to the study than would be possible by simply performing a comparative study based on the students' grades received in the course.

Participants were interviewed before the course, at midterm, and upon completion of the course. This data provided information on how the delivery method affected the learning experience for the students. These observations and interviews were triangulated with observational information, and from interviews and data from the online instructor. The five students involved in this study were interviewed separately in order to generate the most reliable results and were interviewed in the same manner to help identify important common patterns.

Yin (1994) states that the interview is one of the most essential sources of case study information. This conclusion was reached based upon the idea that case studies deal with human affairs that should be reported by and interpreted through the eyes of specific, informed individuals. Interviews provide a means for developing an understanding of what someone has experienced by allowing for explanations from research participants. In addition the researcher can learn about the subjects' opinions, perceptions, attitudes, and gain insight into probable future behavior.

The data were collected using a general one-on-one interview guide approach that provided open-ended as well as closed-ended responses from the subjects. The interviews were conducted using a semi-structured format in order to measure the students' thoughts and feelings about how the online learning environment in this study fit the participants' learning styles and matched their learning needs. Creswell (2002) states that the advantage of using the semi-structured approach is, "the predetermined closed-ended responses can net useful information to support theories and concepts in the literature. The open-ended responses, on the other hand, can allow the participant to provide personal experience that may be outside or beyond those identified in the close-ended options." (p.205)

Each subject was interviewed at three points in this study. A pre-interview was given before the beginning of class to gauge the students' previous experiences, attitudes towards technology and the online learning environment, and also their expectations concerning the course (Interview protocol can be viewed in Appendix B). These interviews provided information on the participants' backgrounds, demographics, and prior-experiences (Fraenkel & Wallen, 2000). The second series of interviews took place three weeks into the course around the semester's midterm. These second set of interviews came after the first few series of assessments and helped in monitoring the students' progress in the course and captured their initial reactions to the online environment. The final face-to-face interviews took place the week after the completion of the course. At this time, all of the students had finished the course and were assigned their final grades. These interviews provided an overall synopsis of their learning experiences and how the online course affected their study strategies, emotions, and achievement. Several follow up e-mail questionnaires were sent out to the students during the

analysis of this information to help fill in some gaps in the study and answer questions that might have materialized during the reviewing of the documents gathered for this research.

In addition to the three interviews of the student participants in this study, several other interviews were conducted in order to provide a more detailed picture of this research. The instructor of the course was interviewed several times to gain some insight into his background, beliefs, and online teaching experience. He also provided information on how the course being studied was progressing and how the research participants were succeeding in class. Two members of the Louisiana Center for Dyslexia and other Related Disorders (Dyslexia Center) were also interviewed during this project. The director of the Dyslexia Center helped provide background information on the center and the services that it provides. She was able to explain some of the ways the Dyslexia Center assists students with learning disabilities with coursework and other hurdles on campus. Some of the assistance is provided in areas such as registration, financial aid, and tutoring. A graduate worker for the Dyslexia Center, who also served as the gatekeeper for the study, was interviewed a couple of times to gain a more holistic insight into the challenges that learning disabled students may face in a classroom. His information was a great help as he offered a first hand viewpoint of the online learning environment from a learning disabled position with no direct ties to the course development or the instruction in the course.

The interviews took place at various locations depending on the interviewee's situation and preference. Some interviews were given in restaurants, classrooms, empty conference rooms, or in the researcher's office. The interviews took place at various times of the day and the students' interviews usually occurred only a day or two apart from each other. One student was unable to come to campus for his final interview and only responded to questions delivered via e-mail. This was the only interview that did not occur face-to-face.

In order to gain more trustworthiness and consistency with the results, more information was collected to support this series of interviews. Additional research data came from virtual observations of the students and course documentation from the instructor. The virtual observations were collected electronically using Blackboard's Course Statistics tools, which allow the instructor to view the number of times, the dates, and the areas of the course that students log on to when they access the online materials.

Additional information was collected from the course instructor to determine how the students performed academically in the online learning environment. This data came from accessing the results of the participants' course assessments developed by the instructor. A final course scoring rubric determined how each of the participants performed academically in the course in the various assignments.

3.3 Location

The setting for this study was a small southern university servicing 7,000 students. The school had been offering online courses for six years beginning in the fall of 2000. Acting mostly as a commuter school, the university slowly is attempting to increase its distance education offerings to accommodate the remote students. At the time of this study, 45 online courses were being offered by the university, but no complete online degree was available. While these courses provide students with the option to earn college credit via the Internet as opposed to traveling to campus, no truly remote student could earn a degree without eventually stepping foot on school property. In the regular semester before this summer session, 700 students took part in 39 online courses at the university.

The majority of students who take courses via the Internet at the university report they are pleased with their online experience. According to recent student surveys prepared by the

school, 75% of the respondents said that the distance learning format was used effectively in their course. Sixteen percent neither agreed nor disagreed, while only 8% disagreed. In similar Likert scale questioning, 89% said they would register for an online class again, while 85% would recommend an online class to a friend.

3.4 Participants

The participants in this study are all undergraduate college students at a small southern university in the United States. Five students (n=5) were selected for the research of this project. Two were diagnosed as learning disabled, while the other three participants did not have any reported learning disabilities (2: LD, 3: Non-LD). The five cases participated in an online course that included 19 students initially enrolled in the class delivered in the summer 2005 academic semester. The LD subjects selected were registered with assistance from the Dyslexia Center. The students were all diagnosed with learning disabilities from psychologists and were active participants in the Dyslexia Center. Three students with LD initially expressed interest in participating in the study, but one withdrew from the course prior to the beginning of class due to financial issues. While the three participants with learning disabilities were selected based on their compliance to take the course, their availability, and their need for the History 101 course, the three non-LD participants were selected by their willingness and fondness to take part in the study.

All the students without a disability registered for the class by going through the assigned course instructor. The process of going through the instructor is used in the majority of the online classes at this university in order to ensure that the students are self-motivated and technologically advanced enough to take an online class. While the demand for classes like these is high, most online courses at this school are capped at twenty students due to the heavy work

load that these courses bring on instructors. In this instance, four spots were left open for up the students with learning disabilities, who were being registered by the Dyslexia Center. Only three students expressed interest.

As expected the class quickly filled up during registration. Online classes are in high demand with students due to their convenience and flexibility. Two other History 101 courses were offered during the summer in the traditional face-to-face method. These courses had enrollments of 40 and 43 in classes with a seating capacity set at 60. Some students on the Internet course waiting list were redirected to these courses. After the class met its 20-student capacity, an e-mail was sent out to all of the students in the course to determine who would be willing to participate in this study. Some e-mail addresses were obtained from e-mail requests students sent to the instructor. Others were located using the students' university e-mail accounts, which all students do not use or check regularly. The university had recently enforced that students use their school e-mail addresses, and thus blocked all students from changing their addresses to personal ones (i.e. Yahoo!, Hotmail, etc.).

After the students' initial responses to the e-mail requesting their participation in the study, I sent out another e-mail asking those that responded about their prior distance learning experience. This follow-up question was intended to provide the study with participants who had a variety of experiences in the online learning environment. Other preliminary information was requested from the students to further provide a greater spectrum of cases for the study. Out of the eight respondents to the researcher's e-mails, four students were selected and were given pre-course interviews to gauge prior knowledge and experiences. The four students without a disability were selected based on their different ages, educational experiences, and history with

Internet courses. One student, “Justin”, eventually dropped the course after the first test. His information is still included, albeit briefly, due to the helpful responses he provided.

It was determined early on that an additional case would be included for both groups of students with and without learning disabilities (n=8) to begin the study. This would provide the researcher with the option to eliminate a participant who provided little information for the study. The use of an extra participant would also be helpful backup if a student dropped the course, as was the case. Unfortunately, only three students with LD registered for the course and one of those dropped before it began. That left the LD cases to only two. When Justin dropped the course, the researcher was still able to study the three remaining students without a disability.

The respondents chosen for this study were Chance Simon, Kathy Deppen, Jordan Bourgeois, Taylor Harrington, and Sarah Pierce. These names are pseudonyms provided to protect the identity of the individuals (Creswell, 2002). Justin Landry’s information is also provided despite dropping the course after two weeks. Kathy, a student with a learning disability, also dropped the course before completion, but due to the minimal time she had remaining in the course she was still able to provide vast useful information for this study.

3.5 Procedures

The design of this study placed the five college students into a specially modified online world history course that required different learning strategies and techniques for unique design modules for the online learning environment. The specially modified course included media-enhanced delivery methods that ranged from audio lectures to content enhancing tools. Each of these methods were developed using strategies discovered in the literature that match the learning styles of postsecondary students with LD (see Table 3.1). These methods were studied

along with other aspects of the online environment to observe the varying effects they had on both the students who were diagnosed as LD and the students without a disability.

In the summer 2005 college semester, the student participants for this study registered for an online History of Western Civilization (History 101) college course with heavy reading requirements. According to Heinman & Precel (2003) the world history course is one of the postsecondary courses that students with LD have had trouble with due to the course’s intense reading requirements and difficult words. The results of these delivery methods were analyzed using interviews, virtual observations, and documentation from the instructor to determine the effects on the students’ attitudes, behavior and student achievement. These results were intended to provide the detailed insight for the proposed research questions.

Table 3.1
Method Strategies for Media-enhanced Online Course

Learning Strategy of Students with LD	Media-enhanced Course Methodology Components
Regular assessments	Weekly Assessments
Time management	Use of calendar
Weekly/Monthly organizers (Reis, McGuire, & Neu, 2000) p. 129	Use of calendar
Online calendars and planners (Mull & Sitlington, 2003)	Use of calendar
Tape recorded materials (Heinman & Precel, 2003)	Audio version of lecture
Oral message (Pedrali & Rossano, 2000)	Audio version of lecture
Less reading (Ruzic, 2001)	Limited use of Discussion Board
Larger fonts and font colors (Mull & Sitlington, 2003)	Larger fonts and contrasting font colors

3.6 Course Design

This media-enhanced course involved online instruction designed using LD research mentioned in the literature. The majority of the course content was delivered using the textbook Western Civilizations: Brief Edition, Volume I. by Coffin and Stacey. Additional materials were provided via the textbook publisher’s companion Website, <http://www.wwnorton.com/wciv>.

This companion site contained a detailed chapter outline, focus questions, and quizzes that the instructor suggested the students take in preparation for the test. These quizzes were not mandatory and were not a part of the course graded assessment. Access codes to the site were provided to the students from their textbooks.

While a nice instructional aid, the Norton site provided headaches to the students early on in the course due to technical issues with the site. Some statements made about this site included: “A lot of times you couldn’t get on there”, “There was a lot of technical problems”, and “The Norton site was down for several days before I could get back into it”. The site did seem to be more reliable after the initial few weeks in the course and was a nice supplement to the students’ learning. Many students found the site helpful in learning the materials and studying for the tests, “(What study strategy helped me in this course was) going over all the quizzes over and over once you take them.”

For the purpose of the fast-paced summer schedule, the instructor divided the course into three sections each one consisting of five chapters of the text along with additional readings. At the completion of each section the students would be assessed by a 100-point test, a two-to-three page essay, and a posting to the Discussion Board, which needed to be at least one paragraph in length.

The materials for the essays came from additional readings that were not included in the textbook. The articles were five, fourteen, and five pages each and ranged in topic from *The World of Muslim* to *Hebrew Cosmogony*. These articles were offered to the students at the reserve desk at the university library and on the course site in Adobe Portable Document Format (PDF), which is a popular software used in sharing, viewing, and printing by anyone using free Adobe regardless of the operating system, original application, or fonts. The history students

were required to read these papers, which ranged from five to fourteen pages, and electronically submit a two-three page summary on the readings to Blackboard's Digital Drop Box. The Digital Drop Box acts like an e-mail attachment, where only the instructor and the student submitting the material had access to view it. While these papers ranged from five to fourteen pages, the students were given the opportunity to use screen readers and text-to-speech software for these readings. Directions were provided on the course site on a variety of ways the students would be able to use these assistive technologies. Students were also given information on how to obtain and use two free software packages aimed at reading digital text on a computer screen.

The first program was a free text-to-speech software called Read Please, which was made available by <http://readplease.com/>. The use of this software required students to simply cut and paste the document of choice into this software's page and a computerized voice could read it to them in a dictation and pace of their choice. Unlike most basic text-to-speech software, Read Please allows the user to select a variety of different voices, which are all second generation computer talk. Research had shown that the monotone and "robotic" sound of other versions of screen readers actually accentuated the difficulties in auditory processing (Bisagno & Haven, 2002). The Read Please software runs on most basic computers with Pentium - 200 MHz, 16 MB RAM, 20 MB Hard drive space, and operating on Windows 95/98/ME/NT/2000/XP.

Students were also given instructions on how to use Microsoft's free screen reading software "Narrator", which is provided on most computers using Windows operating systems. Narrator is a screen reader utility packaged with Microsoft Windows 2000 and Windows XP that reads dialog boxes and window controls in a number of the more basic applications for Windows (Wikipedia, 2005). All of the students involved in the study used Windows-based computers.

For the purpose of this study, each of the three course sections had an audio component of the instructor delivering a brief 2-5 minute synopsis of the materials in his own words. These audio lectures were placed under the Course Documents section in Blackboard by the instructor to help explain some of the course material. About five audio clips were added every other week as part of the content delivery. The composition of the audio was a question and answer session between the instructor and the researcher of this study. The purpose was to have the researcher ask prepared frequently asked questions of the instructor, which he answered into a microphone for digital recording. This use of computer-delivered audio was intended to help the students with LD as well as their non-disabled classmates. The question and answer session was intended to provide a more familiar audio lecture with the instructor putting the content from the readings into a more human conversational form. In addition to having the audio made available by streaming it from the Web, students were given the option of obtaining a CD of the lectures. While the computer delivered instructor audio was a nice content delivery method used to mirror traditional classroom instruction, the majority of the course content was still delivered textually.

Several problems existed in the recording and uploading of the audio lectures. The first series of audio lectures were recorded with an annoying hum generated from the microphone. These made listening to the recordings almost unbearable. Comments concerning these files are listed in Chapter 4. The sound quality issues were resolved for the second series of audio lectures; however students still found the files too difficult to access and had problems opening the large files. The first two series of audio files were recorded, saved, and uploaded into the .WAV sound format. This is similar to compact disc (CD) quality and size. A typical audio lecture saved in the .WAV format was 36,000 KB in size. For the third series of audio lectures, the .WAV files were converted to the more compressed .MP3 file, which decreases the size of

the file to about 6% its original size. By comparison, the same 36,000 KB .WAV file would only be 2,000 KB when converted to .MP3. Changing to the .MP3 format should have no effect on the sound quality and play back accessibility of the file. It was simply intended to reduce the file size for students downloading and streaming the file on the computers.

Another requirement for students in the course was the inclusion of “intelligent, reasoned participation on the Discussion Board”. The instructor posted five statements/questions in the Discussion Board forum and had the students answer these questions and also respond to one of their classmates’ responses. Responses needed to be at least a paragraph in length. Points were taken off for answers that were too brief or turned in late. This type of online instruction leaned heavily on interaction that is learner-to-content, and learner-to-learner driven (Moore, 1989).

These postings made up roughly 10% of the overall grade in the class. The three areas of assessments for this course were: examinations, essays, and Discussion Board postings. The three exams for the course were worth 300 total points, which accounted for 66% of the grade in the class. The tests consisted of 50 questions generated randomly from a test bank of 150-questions so that no students will get the exact same test. At the end of the semester, the instructor decided to drop the lower of the students’ first two test scores due to poor performances.

The exams were made available online where the students had to use a password provided by the instructor to enter and were given a 50-minute time limit to take the tests. The instructor would penalize students overextending their time by taking away two points for each minute past the allotted time. Several problems were reported during the taking of these tests. Some students were booted off of the Website in the middle of tests, while others did not know the dates and times of the tests. Most of these problems were handled swiftly and without hassle

by the instructor. Problems decreased with tests two and three as the students got more comfortable with the expectations of the instructor.

The three essay assignments were two to three page essays that the students submitted electronically to the “Digital Drop Box”. These were worth 33-points each with an extra point given when all three were submitted, making the essays worth 100-points for the class work.

The final fifty points for the class assessments were the asynchronous Discussion Board postings, which required intelligent, reasoned participation on the Discussion Board to a statement/question placed there by the instructor. Students were required to answer six questions on topics related to the chapters in the book and respond to one of their classmate’s posted answers. The students’ initial responses were to be at least a paragraph in length and were to come from knowledge obtained in the textbook and from independent research done through the Internet. The sixth and final Discussion Board assignment was not mandatory and was used as bonus points for the students who completed it correctly.

Asynchronous communication systems can fragment and decontextualize a conversation. However, such a system of communication can provide learners with a record of previous discussions (in the form of posts), and can allow the student to respond to questions or comments regardless of how much time has elapsed since the original post (Ross, 2000). The use of asynchronous communication also allows students to think about their statements before responding, such as noted by Kathy, one of the students with LD in this study, “I’m a person to take awhile to think about something. And my (online) English classes were really good, because it allowed me to think about what I wanted to say or do. I wasn’t pressured into hurrying up.”

To prepare for tests, students were asked to read and highlight the chapters, take notes, and to listen to the audio lectures. A focus question was provided before each test that the

students had to answer on Blackboard's asynchronous Discussion Board. In addition to answering the focus questions, the instructor suggested that the students identify the terms listed at the end of each chapter and become familiar with the textbook's companion Web site <http://www.wwnorton.com/wciv>, which provided short answer and essay questions for students to practice with in preparation for the tests.

An additional feature to this course was the inclusion of the Task and Course Calendar functions made available with Blackboard. Although in my personal experience, few teachers use this feature, it was included for the purpose of this research as a way to keep the students on track and focused on the deadlines for the course. Research has shown that students with learning disabilities have difficulty staying focused and rely heavily on organizational skills to stay on task (Reis, McGuire, & Neu, 2000). The addition of online calendars and planners has shown to be helpful to their achievement (Mull & Sitlington, 2003).

Another feature that was going to be used to provide better delivery context to the students in this study was the incorporating of various font sizes and colors i.e. light on dark, sans-serif. These changes fall in line with the research mentioned above (Mull & Sitlington, 2003). However due to the lack of any extensive online textual materials from the instructor, this feature was not incorporated into this study.

3.7 Blackboard

Blackboard (<http://www.blackboard.com/>) is a leading enterprise software company for e-Education and provides one of the world's most popular course offering software programs (Blackboard, 2005). The university in this study had chosen Blackboard as its course management system from the beginning of its distance learning offerings. All of the Internet

based courses offered at this school use the Blackboard software except for the mathematics courses, which use PLATO Learning (<http://www.plato.com/>).

Students registered in an online class through Blackboard are given a username and password to access the course materials. Once logged in, the students enter the main announcement page, which acts as the portal for all of the course content, information, and communication. These areas are all accessed by links on the left hand side of the page. Figure 3.1 shows the main page of the History of Western Civilization course that was used for this study.

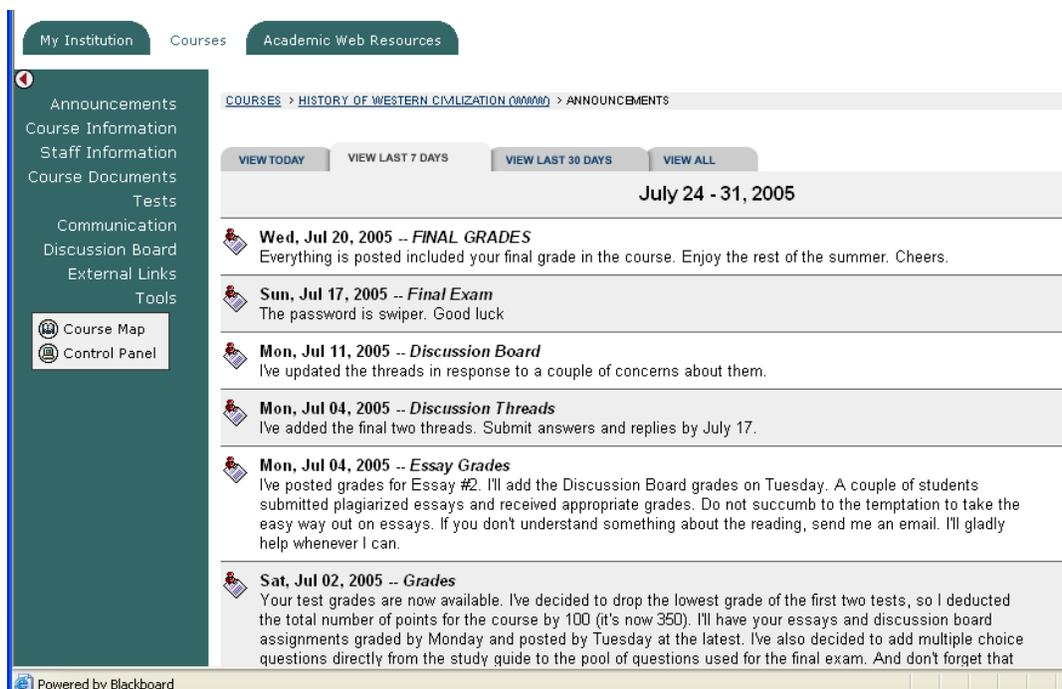


Figure 3.1 History of Western Civilization Main Blackboard Page

For this course, the majority of the content and usage came from the Course Documents and Discussion Board sections. The Discussion Board was used for the students to answer questions assigned by the instructor and as a place for the students to communicate with one another or ask the instructor questions. Most of the direction for the students in this class came from either the announcements on the homepage or the syllabus. The syllabus was located under the Course Documents section, which also included the audio lectures, additional readings, and

several tips to help students use Blackboard. This is also the area where students were given information on how to access screen readers and the text-to-speech technology. Figure 3.2 shows the Course Documents page for this history course.

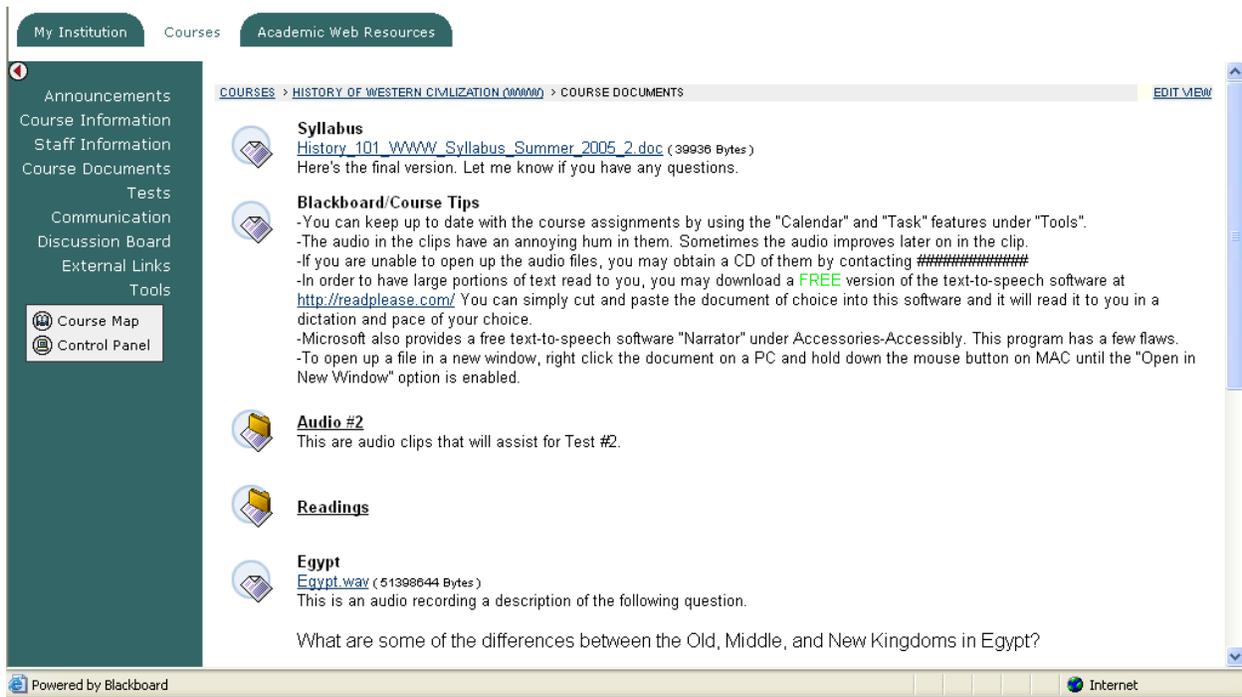


Figure 3.2 History of Western Civilization Course Documents Page on Blackboard

3.8 Course Instructor

The instructor of the course, Dr. Hodson, had been teaching at the university for eight years in addition to a couple of years at other universities and junior colleges. The History 101 course is one of two online courses that he has been teaching for the past two years. Despite initially volunteering to be trained to become a teacher in the virtual world, he still has reservations about teaching online.

This is my second year and still trying to figure out what's going to work best online. It is the responsibility of the students themselves to learn the material. I think it is a more difficult class for them, because I am not there to explain some of these events and ideas that they need to learn like I can in a regular class or a lecture setting.

Dr. Hodson says his online classes are different than his face-to-face courses in several ways. Besides applying different types of assessments, he also incorporates different types of approaches to each course. He feels that he can discuss more information in his lecture class than he can online where the information comes mostly from the text. In the online environment, students are forced to be independent in their learning despite his daily virtual presence.

Hodson says this self-discipline does not always match well with the types of students his course attracts and the reaction from his online students has been mixed, at best.

With history it is very difficult because there is not much of a background in western civilization, so a lot of the things they are actually learning now look bizarre. Some of the names seem strange. Some of the events use odd sounding words, odd sounding names. So they are not familiar with this material. It is just not taught in high school and we get a lot of freshmen in here who take this class and it is a completely new class that they are taking and everything depends on them, their commitment.

The afflux of unprepared students in his online courses is also a possible reason for the drop in student achievement in his online course. Hodson feels another reason is what ironically attracts most distance education students to the online world: location, location, location.

I get better grades in lecture courses, because I am there. I can explain these things with greater detail in class. Students in lecture class tend to be on campus, so they stop by my office during regular office hours if they are concerned about something or if they are unsure about a topic I covered, so I think it is an easier class to take, a lecture class compared to an online class.

With mixed to negative feedback and lower student achievement, the reason Hodson continues to teach online is because of the demand of the distance education students. Hodson offers the courses for non-traditional students and others that cannot make it to campus. He feels it is still a positive means of educating those learners who actually sit down to do all of the work and put in the extra time that is needed to learn the material. Hodson also theorizes about whether the students taking a class online are receiving the same quality of education they would

receive in a face-to-face setting. He says the hypothetical scenario is one that also could be asked of varying traditional classroom settings. “It’s different approaches. Whether it is the same or not, I don’t know? It’s sort of like whether taking a same class from different professors. Do you get the same material? Theoretically you should.”

Some educational philosophers (Dreyfus, 2001) suggest students do not get the same quality of education from their virtual involvement with the materials. Dreyfus argues that the online medium does not allow learners to become proficient and experts in gaining the appropriate skills. According to Dreyfus, this embodiment must come from instructors incarnating and encouraging student involvement. p.48

The instructor’s role in this research was to deliver all of the content in this course. The presence of a sole instructor provides greater control over course material and cuts down on extraneous variables. The instructor was also responsible for gathering the performance data on the students to see how they performed academically in the online learning environment. This information was collected using a 450-point scoring rubric mentioned earlier in this chapter. The instructor was also interviewed throughout the delivery of this course in order to gauge the progress being made by the students.

3.9 Credibility and Confirmability

The very design of many qualitative research studies addresses the issue of credibility, which is the degree to which inferences of the phenomena match the realities of the phenomena. This study was strengthened in its quality and verification by a detailed description, triangulation, member checking, and the use of peer debriefing (Creswell, 1998).

Critics of case study designs have cited external validity as a major barrier to this type of research due to the inability to generalize results. Yin (1994) argues that this criticism is flawed

because many case studies are not used to generalize results, but rather to create detailed descriptions and understandings that will enable others to extend these understandings to similar situations in future research. Detailed description is provided here to enable the reader to determine how much of the results are relevant to their own campus situation.

In order to increase the confirmability of this study, I utilized multiple data sources, known as triangulation (Creswell, 2002). Data were collected from participant interviews, observations of the participants in their learning environment, interviews from the instructor, and course documents relating to the students' learning experiences. The use of multiple sources of data was intended to strengthen the results and support the conclusion to enhance the study by making it more convincing and valid (Fraenkel & Wallen, 2000 p.506).

The information and results provided here were checked by the participants of the study, a peer reviewer, and a gatekeeper, who was used to provide access and comfort to the students with learning disabilities. In instances where questions arose over the direction of a participant's answers I checked my interpretation with the participant in order to correctly interpret the information. In addition, the participants were allowed to view the researcher's final analysis of the findings and conclusions as a form of member checking (Creswell, 1998, p.202) to validate data, interpretations, and conclusions.

A college professor with extensive research experience in human studies and in educational technologies provided an external check of the research process. This check in qualitative research is known as the peer debriefing process. Creswell (1998) suggests that qualitative researchers employ a peer reviewer with no connections to the study to examine whether or not the findings, interpretations, and conclusions are supported by the data. p.202

Creswell (1998) suggests the use of a gatekeeper to assist the researcher in reviewing the qualitative aspects of the study. The gatekeeper was a learning disabled student who helped gain access to the students and provided a level of comfort to the students leading up to the interviews. He already had a trusting relationship established with the students with LD, which made for greater comfort in the interviews with these students. The gatekeeper was an employee from the Louisiana Center for Dyslexia and Related Learning Disorders (Dyslexia Center) and also a successful graduate from the program. Additional assistance came from the Dyslexia Center's director and various other personnel.

The Louisiana Center for Dyslexia and Related Learning Disorders is a statewide agency that was established in 1993 as a result of the Dyslexia Law RS 17:7(11). The number of students utilizing the services of the agency has increased from eight in 1997 to around 140 today. The services that the center provides its students includes a personal staffed computer lab, assistance with scheduling, individual tutoring, and assistance with accommodations including proofreading. Students learn about the dyslexia center from word of mouth, the Website, or from various workshops that the staff hosts throughout the year. All students who are involved in the Dyslexia Center must provide documentation of their disability from a psychiatrist or other appropriate doctor.

In addition to having the participants, external reviewer, and gatekeeper review the findings, other means of controlling the credibility of this study were the videotaping and transcribing of the interview sessions. These measures to trustworthiness helped provide a credible and dependable research study with results that can be transferred to similar practices involving online learning and college students with learning disabilities.

3.10 Data Analysis

Creswell (2002) describes the following steps in which qualitative researchers typically engage in analyzing the data in their studies:

- Preparing and organizing the data for analysis
- Exploring the data
- Describing and developing themes from the data
- Representing and reporting the findings
- Interpreting the findings
- Validating the accuracy and credibility of the findings (p.303)

The findings in this study are detailed in Chapter Five, while a summary of the research conclusions and themes developed from the data collection are represented in Chapter Six.

As mentioned earlier, the data in this research was collected from interviews, observations, and course documents. Data were collected continuously during the course of the study. Results of the interviews were tape recorded, transcribed, and analyzed immediately upon the completion of the interviews. The transcribed interviews were compared to one another in an attempt to locate patterns and themes. They were also measured against information gathered from the observations and other documents to obtain a more detailed sense of the data. These results were eventually reported by the researcher and checked by the course instructor and the study's participants to eliminate researcher bias.

The results of these analyses were used to determine what effects the separate delivery methodologies had on the participants of this study. The goal of this research is not to provide yes or no answers to research questions or to simply put a number on the problem. The purpose of the analysis process is to explain the behavior of the participants of this study and how they

reacted to the online environment in which they were placed. The goal was to provide information on the improvement of instruction in higher education courses taught online that are will most likely be taught to students with varying intelligence and learning abilities.

3.11 Researcher's Role

It is a common conception among many qualitative researchers that most research is ideologically driven and there is little evidence to support the notion of value-free designs. Creswell recognizes this and stresses that the researcher is an active participant in qualitative research typically present in the foreground as compared to the more objective quantitative study (Creswell, 2002). Chapters One and Two provide a summation of the theoretical perspective which I have chosen to take concerning this research. As a foundation to my research design, I have concluded that it would be unwise to attempt to gain an understanding of the students' feelings towards the online environment in this study without considering the historical and environmental context in which such lived experiences exist. Likewise, I feel it would also be beneficial for the reader to gain some perspective into the context, or the researcher's personal experiences with the delivery methods involved in online learning and my experiences with students with learning disabilities.

As an administrator of higher education for six years, I have been involved with online learning at the university level from its early beginnings. It is in my position to assist faculty in developing, implementing, and evaluating online courses. It is my belief that online learning and distance education are not the saviors for education as some perceive it to be. Research has shown that there is no significant difference between taking a course online as opposed to sitting in a traditional face-to-face classroom (Russell, 2002). However, I do believe that since there is no visible academic difference between the two delivery methods, it is important to continue to

offer and improve upon the online medium due to the undeniable benefits it has to its students (i.e. convenience). In 2005, online learning is still in its infancy stage and should continue to be taught and researched to determine what works and what does not. The technology is not going away and neither are the students, as numbers show (Meister, 2000; IDC, 2001; US Department of Education, 2001; National Center for Educational Statistics, 2004).

My experience with students with learning disabilities is not as extensive as what I have in the field of online learning. Being the principal investigator in several projects involving disabled students sparked my interest in students' learning disabilities and how technology can aid in their education. During the course of my doctoral program, I tailored my research in this area by conducting several quantitative and qualitative studies. My view is that students with learning disabilities are an often overlooked entity in the world of higher education and a virtual invisible entity in the online world of higher education.

3.12 Materials Used

The following hardware, software and other materials were used in conducting this research. The items are listed here in an attempt to assist researchers who choose to replicate this study.

As mentioned earlier, the course management system that was used to deliver the online learning materials for this study was Blackboard Learning System - Basic Edition™ (Release 6) (<http://blackboard.com>). The majority of the course content was delivered using the textbook *Western Civilizations: Brief Edition, Volume I* by Coffin and Stacey. Additional materials were provided via the textbook publisher's companion Website, <http://www.wwnorton.com/wciv> and the study guide, *Western Civilizations. Study Guide, Volume I* by Minor and Wilson.

The software program that was used for the text-to-speech reading portion of the study was Read Please (<http://readplease.com/>). This software was linked on the Blackboard site for students to access.

Additional items required for the case study included notepads, a scanner, and a video camera used to record audio interviews in addition to the recording of the audio lectures. The recording of the interviews will help the researcher go back and review the segments repeatedly; they can also be viewed for an outside audit of the research. The audio lectures were recorded on Mini-DV and edited using Apple I-Movie (<http://www.apple.com/ilife/imovie/>). The third series of audio lectures were converted to .MP3 format using the audio program Musicmatch 9 (<http://www.musicmatch.com/>). Apple's I-Movie is available free with most new Apple computers, while the Free Jukebox on Musicmatch is available as a free download.

3.13 Timeline

April 2005	Develop courses for instruction
April 2005	Identify students for participation in study
May/June 2005	Pre-interview participants
June 6, 2005	First day of class
June 2005	Observe participants learning
June, 2005	Interview students during semester midterm
July 19, 2005	Summer semester ends
July 25-28, 2005	Conduct final interviews with learners
July 2005	Analyze data and interpret findings
August 2005	Organize and write-up results; draw conclusions

CHAPTER FOUR. PRESENTATION OF INDIVIDUAL CASES

The instrument for this study was primarily the interview with the majority of the “data” being the voice of the students. The attitudes and feelings of these five students were combined with other materials to answer the research question proposed earlier, “What are the students’ perceptions to their online learning experience in relationship to their academic performance?”

Below is a detailed description of each student and their viewpoints before, during, and after the course. The quotations below are from the participants’ perspectives and are kept in their own language including grammatical errors. The findings from these interviews are combined with performance scores and compared with the other participants to shed some light on the research questions that directed this research.

Table 4.1
Comparison of Research Participants

Participant	Age	Learning Disabled	Grade Point Average (GPA) prior to Study	Number of Online Courses prior to Study
Chance	21	Yes	2.013	One
Kathy	43	Yes	3.231	Seven
Jordan	39	No	3.0	Three
Taylor	34	No	2.286	Three
Sarah	21	No	3.118	None

4.1 Chance Simon

Chance Simon is a 21-year-old marketing senior who is diagnosed as learning disabled. Chance had taken one online course before in 2004, getting a ‘B’ in an Internet based music appreciation class. In addition to his three part-time jobs, Chance was also taking five summer courses including this history course. Chance has recently begun to increase his course load in an effort to accelerate his college career and graduate in May 2006. Entering the summer 2005 semester, Chance had accumulated a 2.013 grade point average (GPA) and considered himself a

'B' to 'C' student. Like the majority of students with learning disabilities, extensive academic reading has been a difficulty for Chance.

I don't like to do it, but I do it when I have to. I find something interesting and I'll read it. But just to do something that someone tells me I have to read then No. I tend to have a negative attitude towards it.

Chance considers himself above average when it comes to dealing with computers and related technology. He had a good experience in his previous online course, which was set up differently than the history course for this study. Teaching online was new to the music teacher and he did not use communication tools like Blackboard's Discussion Board. The course did provide a lot of audio music clips that the students could download although no audio lectures were provided. The lecture notes were provided on Blackboard, which Chance printed up and read later in lieu of reading it from the computer screen. The asynchronous nature of the course is what appealed to Chance and made him interested in pursuing more online options, "It was really like an independent study and I like that. I passed the class with a good grade."

Chance is a quiet confident individual, who takes on many challenges in spite of his learning disability. Despite his below average college grade point average, Chance continues to hold three jobs and challenges himself with heavy workloads during the semester. Chance's aspirations are to graduate in May 2006 and then to use his marketing degree to work for a buying aspect of a department store.

Prior to taking the online course for this study, Chance had just completed a trip to Europe, which counted for six college credit hours. Immediately upon his return, Chance resumed his three part time jobs and prepared for his three other summer courses, one of which was this online history course. The fact that the history course was available asynchronously through the Internet was one of the selling points for Chance for taking this class. This allowed

him to focus his attention more on the content without getting distracted from the delivery medium. “The fact that it was online made it convenient that I don’t have to sit and go to a lecture. There is no lecture everyday. Because lectures get boring and I get tuned out very easily.”

Like most students in the class, Chance struggled on the first test scoring a 35 out of a possible 100. The class average was a disappointing 61. This failing score did not completely dampen Chance’s confidence, despite the fact that it made up for 20% of the final points in the course. He just realistically lowered his personal goal in the course to accommodate the missing points, “After the first test, I realized I won’t be getting an ‘A’. (I’m) kind of down, but I will have to work for a ‘B’, unless he drops or replaces our first one with another one.” Chance’s hopes were answered as Dr. Hodson eventually decided to drop the students’ lowest test score from the first two tests.

Chance’s complaint about the first test was not due to the unfamiliar questions as his classmates commented. While the majority of the class complaints dealt with issues dealing with the test questions and a few computer glitches, Chance simply ran out of time in the 45-minutes provided by the teacher to answer the 50 questions.

There was not enough time. Time factor played a big part, because he said if you went over the time period, you were deducted two points for each minute you were over and that was a big factor. I didn’t go over, because I didn’t read half of the test because I was worried about time running out.

Being a student with a diagnosed learning disability, Chance is given the option of having extended time when taking his test or being allowed to take the test in person in the university’s testing center. However, Chance did not present his disability to the course instructor prior to taking the course, so he was not allowed extra time on the first test. After notifying the instructor of his disability, Chance was given extra time on the two subsequent tests. No other student in

the class was given extended time. Kathy, the only other student in the class with a learning disability, did not notify the instructor as Chance did. After making his disability known to Dr. Hodson, Chance was given double the time to take tests two and three.

As in most postsecondary institutions of higher learning, the onus of reporting a disability is put on the student and not the school or its staff. While the Americans with Disabilities Act offers protection for students with disabilities, the burden of proof of the disability rests upon the student (ADA, 1990). In order to remind students of this law and to protect the faculty, the university requires that all syllabi include the following statement:

If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of your academic accommodations.

Surprisingly, despite research on students with learning disabilities and their aversion to reading (Kavale & Forness, 1996), Chance did not grumble about the reading for this course like the other students in this study, as he found the load to be similar to his other courses. In fact, it was not the amount of material that the course required to be read that bothered Chance, but rather the topic of the materials as Chance mentioned around midterm, “Reading is going fine. I don’t like the religion part of it and that seems like the whole course. It’s just that this time in my life I am not about reading about that. That’s it. It is more the content about religion in general.” Chance did not elaborate on what it was about the content that bothered him so much.

In addition to his attitude towards the reading, Chance also contradicted earlier research with his views on the audio and Discussion Board components of the course. Contrary to the expected outcomes, Chance found the audio to be unnecessary, while the Discussion Board was beneficial to his online academic experience. At the completion of the class, Chance thought the

Discussion Board was one of the most important aspects of his online learning experience. In contrast, he found the audio lectures unhelpful and ineffective in his pursuit of academic success in this course.

As mentioned earlier, the instructor included brief audio lectures three times during the course to assist students in their learning. These 2-5 minute question and answer sessions were meant to provide the students with some helpful content on the subject matter in the professor's own words. While the first series of sound bites were inaudible and filled with technical glitches, the second and third group had no such difficulties, but still proved useless to Chance's learning strategy.

I had problems with it before, but I think I got it now. But I guess I have to be really focused for that and I haven't been lately. As far as... just not having enough time I guess for me to sit there and get really focused and understand.

While the audio lectures just require students to sit and listen and interact with the content, the Discussion Board requires them to type and read and interact with their classmates. This interaction pleased Chance and was the other bright spot he found in the course besides the ability to take it at his own leisure. Once again, contradicting this researcher's expectations, the students with LD enjoyed and thrived in Blackboard's Discussion Board feature. Despite only posting the required answers and responses mandated by the instructor, Chance still used the Discussion Board to check in on his classmates' progress.

You can go on there and see if anyone else had the same problems that you did. Fast. I have not done a lot of posting, but I read others. Someone already posted questions (that I was going to ask the professor). I actually like getting feedback to see what other people feel about my paper compared to theirs. I don't mind getting feedback.

Despite their approval of the Discussion Board, Chance and Kathy, the two students with LD in this study did profess to reading the fewest amount of discussion threads posted by their

classmates. Of the six postings required by the teacher, Chance tended to read fewer and fewer during the course of the semester.

The first one I probably read the most. The second one, I just read a handful. It is a lot of repetition after reading the second group. A lot of them are saying the same thing. Some of it was helpful to my learning, but a lot of them were repetition.

Another key finding concerned the reading of the three essay articles that were required during the semester. These readings, which were an intense 5, 14, and 5 pages, were an extra reading burden to the students in addition to the textbook, study guide, and Discussion Board. Despite being aware of several text-to-speech reading programs made available to students in the course, none of the students in the study decided to attempt this endeavor to limit some of their reading. Chance particularly felt that that dealing with the software would not be worth the time and effort, "I printed them out. I can't read them online. I did not try screen reading software. I felt it would be too much hassle and not necessary. I have my mother read it (the articles) and get her interpretation as well."

After contemplating dropping the course due to exam scores of 36 and 55, Chance decided to stay in the class needing only a grade of a 'D' to earn credit. His perseverance paid off as he managed to pull a respectable 72 on the final test in the course. This combined with high marks in other areas earned him a 'C' in the course. Chance had earned a 'D' in History 102, when he had taken it three years earlier in 2002. It is discouraged, but not unacceptable to take History 102 before taking 101. Taking the 102 course three years before taking 101 is an unusual practice however. Sarah had also taken History 102 prior to this course, earning a 'C' the previous summer. Sarah was also the only participant in this study to have taken History 101 beforehand, dropping the course in the fall of 2004.

One other disappointing note on Chance's online class experience was a zero he got on the second essay assignment for plagiarizing a work he found on the Internet. He was one of two students in this study to plagiarize an essay. Chance finished up the course and the study disappointed with his experience in the course. He avoided meeting face-to-face for the final interview and finally responded to the questions via e-mail after several phone messages and e-mails that I left for him. After two weeks of constant nagging, Chance simply responded to a list of questions I e-mailed him and added nothing further about the study.

Chance also struggled in his other two face-to-face courses during the summer semester, receiving a 'D' in both classes. It is hard to tell if they were equally frustrating as the online course, since he failed to respond to any follow up interviews. Chance did reply that he would not take any more online courses despite not reporting anything negative about his time in the history course. More of his responses and my interpretations are found in Chapter Five.

4.2 Kathy Deppen

As the other learning disabled student involved in this study, Kathy Deppen is a rare non-traditional student involved with the Louisiana Center for Dyslexia and Other Related Disorders. At 43-years of age, Kathy is returning to school after a twenty-four year break from high school and likes the support she gets from the Dyslexia Center with managing her time. Working as fulltime bookkeeper at a school and managing a house with two daughters and a granddaughter, Kathy has been taking a couple classes a semester for a few years. Despite these distractions, Kathy manages to find time for her studies, "I get off of work at 4pm and I try to get stuff done before the baby comes home when he is with the mother or I do it late at night when they go to bed." History 101 was one of two courses that Kathy was taking during her time off from work for the summer, the other being a more favorable face-to-face accounting course. Accounting,

which is the degree that Kathy is seeking, was expected to be the more favorable course due to her preference for dealing with numbers as opposed to heavy reading, which Kathy says makes her tired.

The intense reading and heavy workload in history seemed to have a negative effect on Kathy's accounting course as well. Kathy felt that she was spending so much time working on her history class that she neglected her studies in accounting. Despite earning a 'B' in her accounting class, Kathy was disappointed and knew she could have performed better. She blamed this frustration on the fact that the history readings monopolized her study time.

The history course marks the eighth class that Kathy has taken online at the university, following a series of Developmental Mathematics, College Algebra, Fundamentals of Public Speaking, Computer Literacy, English Composition I and II, and Principles of Biology. Kathy has chosen to take many courses online due to the convenience factor with her work and family responsibilities. Despite taking seven online courses prior to this study, Kathy said the Discussion Board feature was only used in one of the courses and only minimally in that course. The brief time spent in this course conversing asynchronously with her teacher and classmates had a positive impact on Kathy's online experience, "I liked it because you got good feedback from people and some of it that was said was things that you didn't think about." The asynchronous communication also appealed to Kathy due to her shyness and displeasure with being put on the spot, "I'm a person to take a while to think about something. And my (online) English classes were really good, because it allowed me to think about what I wanted to say or do. I wasn't pressured into hurrying up."

I found Kathy to be a quiet, shy person, who sometimes felt overwhelmed by the task that lie ahead of her. Returning to school after a layoff, Kathy is working on an accounting degree to

help her improve her employment status, especially during tough budget times at her school. “I worked for 25 years and the salary I make is not very good after 25 years of working. I want to get an accounting degree. I would like to be able to do some accounting on my own unless there is a good job out there.”

While some students exhibit math-related learning disabilities known as Dyscalculia, Kathy apparently is not one of them. With a career in accounting, Kathy is more prone to use to the right side of her brain, which is more attuned to mathematical analyzing, than the left side of the brain, which is more adept at understanding language and logic (Ward, 2003).

Kathy incorporates several learning strategies to aid in her learning including printing out materials for later reading and rewriting key definitions found in textbooks. Kathy also has to read over materials several times in order to really comprehend the information, “I have to reread a chapter to understand it and with so many chapters (in history) that have to be read, plus the other stuff, I don’t have time to reread the chapters.”

Like most students involved in this study, Kathy became increasingly discouraged after her performance on the first test. Making a 50 out of a possible 100 after the seven point curve, Kathy questioned whether or not she would be able to receive a passing grade or continue in the course for the duration of the semester. The problem with the test was not a matter of time in taking the test, but rather in preparing for it.

I find it’s just a lot of reading. I guess you can’t say a short period of time with two classes having to read a lot. It’s a lot to read the chapters. I did the study guide. The only thing I didn’t emphasize a lot was the short answer and essay questions, because of the reading time it took me for the chapters.

Besides the amount of reading required for the class, Kathy also had difficulty with the kind of reading required for the class.

The chapters are kind of like (overwhelming gesture). I guess it is probably the wording of some of it. It is just these strange names and these strange words.

Some chapters are really, really bad with that. Those are a little more complicated. Chapter six to me, I really understood that one a lot. But then as it went along, some of them just got more confusing to me. And you see those chapters I would probably have to reread, but it's like I don't have enough time. I am already spending six hours reading and trying to pull out information and doing short answers, to have to try to go back and reread.

The reading requirements in this course seemed to frustrate Kathy more than the other participants, most likely due to her learning disability. Kathy never seemed to have enough time to complete the readings necessary to achieve success in the course. Her fear of reading in this class also increased her fear of taking the tests, giving her a form of test anxiety.

Sometimes I do get nervous when I go to take a test. Especially when I look at and it's like oh my God this is nothing like what I reviewed or went over. Especially if they give you a study guide to study from and none of it is what's on the test. A whole chapter of 20-30 pages, to help me comprehend it more, I would have to reread it more than just one time. And having that many chapters there is not enough time for me to go back and reread it.

Like Chance, the other student with LD in the study, Kathy also found little use for the audio lectures provided by the instructor. But unlike Chance, who avoided the audio because of time and focus issues, Kathy attempted to use the audio, but was overwhelmed by technical problems. Trying to access the 22,000 KB-50,000 KB files on her home dial-up computer, Kathy's system crashed in her downloading attempts.

Another student told me that she has dial up at her house and she can't get it at home. I have dial-up at my house and I can't pull them up. But what it does, when I pull it up, it will popup a windows media screen and I have to unlock the thing and I can press play and it won't go. It will jam my computer. What I have to do... I have to get out of my computer and end my task, because it actually jams my computer. I never had trouble pulling anything up from anywhere, but for some reason, this audio stuff, I can't pull up. So that's another thing. I am not able to get the audio stuff to see if any of that will be able to help me.

The day before the second test was made available for the students, Kathy was given an audio CD that had the lectures on them, but found little use in these sound bites even when able to listen to them. "I don't find it was a whole lot there. There was only like three little talk

sessions on it. I don't know if there was supposed to be more on there or what. I don't find I got much out of it.”

The one area in the course that Kathy did use and benefit from was the Discussion Board feature, which all of the participants in this study seemed to enjoy. Like the others, Kathy liked using the Discussion Board to see if anyone else in the class was having problems and used it to discuss concerns of her own. She stated that it helped give her ideas when she was stuck on what work was required of her. She liked that someone was always there to “help you out.”

In addition to the personal interaction with her classmates, Kathy also enjoyed the posting of the question and answer assignments to the Discussion Board due to the variety of viewpoints and information that were provided by her peers.

I like reading classmates' work because you can have a view on a questions that he is asking and then you go look at somebody else's and they pulling a different view of the whole situation. It gives you the opportunity to look at it in a different way. I don't think I would be posting anything that nobody else should be reading.

Despite their appreciation to view their classmates' discussions, Kathy and Chance were the only two participants in this study that said they read less than half of the postings on the Discussion Board. Kathy's reading of the postings was similar to Chance, who stated he only read a handful of the postings. Kathy stated, “I go into several just to see what they say. I don't go into every one of them, but I do go into at least five or six of them and go and just see what they have.” These responses are supported by the course data on the number of times the students in the class accessed the Discussion Board to read and post materials. Kathy and Chance had the fewest hits of any of the students in this study (see Table 5.1).

Unfortunately, Kathy was unable to finish the course due to a fear of getting a failing grade. She dropped the class after the second test with ten days remaining before the final exam.

Kathy received a 63 on the second test, a 13-point improvement from her first exam. However, the poor marks combined with other low scores on other assessments forced Kathy to drop the class before completion.

I made two F's in the class on the two tests we had. I actually thought I did better on the second test we had than I did on the first one, but it was just as bad. I heard he dropped one (test score), but I had two F's, so what were my chances?

When Kathy dropped the class, she was on the same path or slightly ahead of two other students in this study in terms of points accumulated. The other two students, who decided to remain in the course, were rewarded with a dropping of one of the first tests and more user-friendly third test. Both of these students received C's in the course despite being well below average at midterm. Being an above-average student, Kathy could not risk staying in the course and hurting her grade point average. "I don't like making the grades I made on there. I felt like I didn't know nothing. I don't like making D's I could have hung with a 'C', but not a 'D'. Those grades just drop your average too much."

Despite her disappointment in the course, Kathy thought about taking the same course from the Dr. Hodson online again in the following semester. However, when an early morning class opened up on campus, she decided to take the course with another teacher. The early 7:30 a.m. class time fits around Kathy's schedule requiring her to miss only a minimal amount of work. If this early morning class were not available, Kathy would have taken the same online course again with Dr. Hodson.

4.3 Jordan Bourgeois

Jordan Bourgeois also has the task of balancing kids with a fulltime job while returning to school after a long absence. And like Kathy, 39-year-old Jordan has also taken the online route to obtaining the majority of her degree, hers in nursing. Working in a remote town 90-minutes

away from the nearest university, Jordan enjoys taking distance education courses that conveniently fit into her schedule.

I think for people that are in rural areas or have to travel long distance and have to juggle different things; I think it is a great aspect. It helps me. It is doing a service for me and I am going to take advantage of it. You have to learn. There are tests. There are things that are expected. If you don't do them you are only cheating yourself. I learned more math than I've ever known. You have to put forth the effort. Like for anything. I just think it's worthwhile.

Taking three online math courses in her previous three semesters before this summer, Jordan had a small spectrum of experiences in the virtual education world. While two courses incorporated the kind of instruction and feedback that Jordan is comfortable with, one teacher almost made her rethink the distance learning route for her studies.

This past semester (with math) was just awful. It was just a combination of what they were teaching on the program and the book to what the teacher had on the test, I just found it a big struggle. She was a nice person; I just found her tests to be quite different. I feel like you are limited... You are teaching yourself online. Through the program you are kind of limited and when she veers off from what you are going through with the program it caused me a lot of confusion. It was very hard to even get in touch with her. Sometimes she did not respond to students.

The three math classes that Jordan had taken on the Internet prior to the history course were the only courses offered online by the university that did not use the Blackboard course management system. These courses offered on the PLATO format did not provide any kind of interaction (synchronous or asynchronous) between the students and their classmates or the students and the instructor. All of the interaction was between the student and the content (Moore, 1989). Jordan really enjoyed the student-student and student-instructor interaction that was available to her for the first time in the history course.

It is very clear and it is easy access to him. He (the instructor) answers questions daily. You can also interact with other students. He has a board set up where you can discuss concerns or questions with other students. It can be very helpful. I used it a full time. He even answered a question I had on there. I think it is a great

way to interact. And he has everyone respond to people's answers on the Discussion Board and that gets people talking. I think that is a good idea. It is a little interaction, where Math you were kind of alone and this is a nice change.

The addition of this communication was a nice improvement from Jordan's earlier experiences in the Math PLATO Learning software. In fact, Jordan even found the interaction to be on par with the dialog found in a face-to-face educational setting.

I think it is easier, because you are online. Some people are shy and some people aren't, and I think it is almost easier to put a question out without worrying about appearing stupid. It is almost makes it a little easier.

Of course, the interaction in the history course that Jordan speaks of is the asynchronous Discussion Board that students with LD, Chance and Kathy, both enjoyed. However unlike those two, Jordan noted that she read all of her classmate's postings and even occasionally responded to more than the mandated one required by the instructor.

I found some good points people made and I responded back to them. If I find something that I can really give back. I try to pick someone that wrote something a little different from me. The last question was about the crusaders and I tended to see it this one way and I think Braiden (classmate) came up with how it affected the future and he gave some really good points, so I responded back to that. I found that was a very good answer he posted. That tends to draw me back to if they wrote something different than I thought of.

During the interviews of the students conducted at midterm, Jordan was the lone respondent who expressed pleasure in the course. This was partially due the fact that she received a 93 on the first test, thirty points higher than any of the other participants. While maintaining an 'A' in the class at midterm, Jordan stated at this time that she was surprised at how well the course was going.

Everything has worked out so well. I don't think I could have learned anymore had I gone over there and he talked. He had it all laid out. He answers all the questions. He doesn't ignore your concerns or anything like that. It's more than I expected.

Like the previous two students in this study, Jordan had difficulties with the audio lectures delivered online in this course. While not being able to access the files at home on her dial-up computer, Jordan listened to the question and answer sessions at work but found little help in them with regard to learning the subject matter.

The content matter matched the chapter, but it is just a small little portion. It is kind of like reading the summarized page. You get more out of it if I take notes and go back over it. So I haven't really bothered with it that much. I try to focus more on taking notes and things like that, going back over my notes.

This method of learning the materials apparently is what works best for Jordan as she was one of only two students in the entire class who earned an 'A' at the completion of the course. She was also the only member of this study to receive an 'A'. She also left the class with what was perceived to be the best attitude concerning her experience. The complete scoring rubric for the class can be seen in Chapter Five (Table 5.4).

4.4 Taylor Harrington

Despite the limited interaction in her previous online courses, Jordan was able to make a connection with Taylor Harrington in a mathematics class they had taken together previously. The two became friends during some of the mandated face-to-face meetings that the instructor required. Taylor is a 34-year-old working mother, who has struggled academically since returning to school for a graphics design degree. Taylor has toiled in her four semesters since coming back to college, holding a 2.28 GPA heading into this study. More than the previous non-traditional students, Taylor has an outgoing personality. She has been the initiator in several virtual friendships formed in recent semesters including during this summer. During the history course, Taylor befriended Kathy while helping her work out her audio problems.

A college degree is a personal goal that Taylor is striving to achieve in order to improve herself and her professional career.

I am going for me. I am paying for it. I am not a teenager. I have the discipline to do online classes. I am going to school for my own self satisfaction and not really for monetary gratification. I am doing it for myself. I don't know if that makes it harder or easier. I've always been a little ahead in my online classes. I am up in the middle of the night when I can't sleep doing work.

Like the previous non-traditional students in this study, Taylor has chosen to take the majority of her courses online due to the convenience factor of holding down a family and a job. Despite the limited interaction with the instructor and her classmates, Taylor has had a relatively positive experience when it has come to distance learning. The luxury of not meeting in a regular classroom at a set schedule every day is what she finds most helpful with the online world.

I can do it at my own pace when I have time. To work around my life and my kids. That helps me and people like me. It gives people other ways out. I can't go to school, so this gives me an option. It will come to time when I know I have to go during the day.

Besides two online math classes, Taylor also took part in an Internet based speech communication course that ironically contained no interactive communication between the students. The course was an electronic textbook as Peraya (1999) mentioned earlier. The lone blemish on Taylor's positive Internet experience was the same remedial math course that Jordan had problems with. This course forced the students to learn without the presence of an instructor: physical or virtual.

The book and the software were not the same. The teacher was a whole different story. We would go in there and feel confident. Stuff was never covered. You spend most of your time spent online.

If it were not for the convenience factor of not having to commute and not having to sit in class during traditional daytime college course schedules, I got the impression that Taylor would prefer the face-to-face environment more than the virtual one. She is a confident outgoing personality in her community and liked the mandated classroom meetings that her previous online courses required for student orientation and tests. Bonne (1996) found that orientation

days can help anxious distance education learners adapt to the new learning situation. Taylor appreciated how orientation gave the students an opportunity to have the teacher explain what he expects from the students, “I just think it is nice to put a name to the face and meet your classmates. And then you can correspond at least you can know who you are talking to.” This view was not shared by all the members of this study. Many of whom felt that an initial orientation was useless and would not want to come to campus for such an event. Chance went through an orientation with his online music class, but found little use for it.

My music class had one (orientation) and I thought it was useless. They say that you are supposed to meet your classmates, but the point I have a hard time of remembering a name with a face, so you are only meeting them once. It was hard for all of us to get together at once. Maybe orientation for people with first time online classes, but not mandatory.

While the history class did not have any face-to-face meetings as Taylor had hoped, it did have the Discussion Board feature, which was a way of communicating that she had not used before. Taylor described the Discussion Board as “fun” and “I liked it”, but she did have some reservations about putting her thoughts out there for all to see.

One scary thing is that whatever you type, everyone gets to see. That is a little scary. But you can see what other people have concerns about. Even if I might not ask you about it, I can see that somebody else asked that question. And I learn from their questions and vice versa.

Being a vocal and active learner, Taylor took advantage of the Discussion Board, posting several comments and trying to solve classmates’ issues remotely even offering her phone number to provide aid for technical problems. Despite not finding much useful information in the required discussion threads, Taylor did find time to read all of her classmates’ postings.

I read everybody’s. Responding to someone else’s Discussion Board posting is a little difficult. I don’t care for that part. I feel like pretty much everybody is saying the same thing. You’re reading the same stuff. There’s not too much that you have to interpret. I am having a problem responding to someone’s work.

Reading the numerous postings on the Discussion Board was just one of the many reading requirements expected out of the history course. With her active work, family, and social life, Taylor found the workload i.e. reading in the course to be a lot in the crammed six weeks of the summer semester.

It is a lot in the short period of time. If it was just reading and studying, that would be different, but it is the extra reading for the essays, and the questions and responses. But if you didn't have the other stuff that you had to do, you might be able to put forth more time and effort to do it. The essays alone take a lot of time, because there is so much you have to read and read into to try explain to write a three page essay.

Taylor felt the extra work interfered with her test preparation as the tests accounted for 60% of the grade in the class. Unlike her previous online math courses, the tests for history were offered completely online, which took a little getting used to.

When I told my husband that the test was online, he said, "Well that is good". I said, well not really, because at least face-to-face you may get partial credit if you give part of an answer. There are pros and cons to both sides.

Despite having to rush to complete her exams in the allotted time, Taylor stated that she would prefer not to travel the 30 miles to campus to take the test in a classroom if the option were made available. She still preferred the convenience of taking the test through the Internet.

Taylor had little problems accessing the audio lectures from the course site, but did not find much usefulness in them despite being one of the few students to download them all successfully. The audio distortions on the first group of lectures made hearing them virtually impossible. While the second and third series of clips were more understandable, Taylor still elected to write down what she heard on the files instead of just listening, thus virtually defeating the purpose of the addition of sound for this study. Like her classmates responded, Taylor found little use out of the mini audio lectures, "It was very limited. I mean, two minutes didn't really

get too much into that subject. The first two were not worth anything. It was so short. I don't think they're long enough. Two minutes isn't much.”

Taylor received a 57 and 59 on her first two tests in this class in addition to a zero on an essay for plagiarizing. She contemplated dropping the course around midterm, but decided to stay in the class. Dropping the course would have required her to come to campus and that was not possible with her work schedule. Taylor improved with a 74 on the final exam and eventually got a ‘C’ in the course due to her improvements. Taylor was pleased to be leaving the course with a passing grade and was generally pleased with her performance. She repeatedly emphasized her fondness of distance learning and would continue to take these courses including additional classes from the same instructor if possible.

4.5 Sarah Pierce

Sarah Pierce is the most “traditional” of the five subjects selected for this study. She is 21 years old, has a low paying job at a pizza restaurant and holds an above average 3.118 GPA. Sarah is also the only subject in this study without any prior fully online classroom experience. Sarah stated that this will change as she wants to become involved in more online courses for the sheer fact that she has to commute two hours a day for school. Despite being a novice to distance education, Sarah entered the history course with mixed expectations about the content and context of the course. Prior to the course, Sarah claimed history bored her and it was her worst subject revealing that was one of the reasons for taking the class online. Other reasons included positive recommendations from friends who said that online learning was fun and the ability to avoid a two hour drive every day. Sarah entered the course with above average computer literacy and was looking forward to her first distance learning experience.

I'm pretty confident. I am interested in how it's gonna be, because I never have taken a class online. I took History 101 (face-to-face) previously and winded up

dropping it. The first test I still remember. No worries. My English 310 class used Blackboard a lot as a course supplement.

The asynchronous interaction was one component that fit Sarah's personality style prior to taking the course. Sarah is an introverted learner, who prefers to gather her thoughts before acting upon them. "I am kind of closed in. I don't participate too much in class unless it is something that sparks my interest. I would rather listen. I think of something 10-minutes later. I have time to think about it and proof read my thoughts."

Sarah also has an unusual way of handling time management in her life... she does not sleep much. She states that whenever she has time to do something, she does it and if there is a big assignment due, she will not sleep. She said the management of time was easier in this online course as opposed to having to drive an hour each way every day to come to class. Instead she uses the extra idle time to become familiar with the course content.

I can't spend everyday on it, because I work a lot from open to close, but I'll make up for it on other days. Maybe I'll read a couple pages and take a little notes. I take each chapter how many pages it is and divide it up between the days. If I can't do it that day, then I just do extra the next day. So no matter on how many pages it is I divide it up between how many days I have. I spend about two hours a day (on class work) depending on my work schedule.

Despite the heavy reading requirements of the course that overwhelmed her classmates, Sarah took it in stride even when dealing with the sometimes difficult content.

I don't mind reading. It is just too many facts to remember. If you take science you can kind of relate different things together, but in history it is fact after fact after fact. I find history harder than science stuff.

Upon completion of the course, Sarah stated that the Discussion Board was her favorite part of the course. Still she found a lot of her classmates' postings on the Discussion Board to be redundant.

It's like you read it and just about everyone's answers are the same. But when you read the responses some people pick out certain things that other people said and

it is kind of cool, because you get different opinions about this one story and I like it. It is really easy. I thought it was going to be really difficult, because I didn't know what to write. But after I saw other people doing it and I saw what they were writing and stuff I got used to it. I like it a lot.

Sarah was similar to the other two non-learning disabled students in this study, who took the time to read all of the students' responses and looked forward to logging on to the class everyday to see new messages from classmates. Jordan and Taylor also were eager to "go to class" every morning to see what their classmates had said over night. It is sort of like office workers rushing to open their e-mails first thing in the morning to read their messages from friends and family.

A self-confessed shy person and passive learner in the classroom community, Sarah also had little trouble opening up online and presenting her thoughts and answers for all to see.

I don't have a problem with it, because then someone can give you feedback on it. You kind of learn from them if they correct your mistakes or if they throw in something extra. I like reading other people's things just to get their opinion on it and stuff.

Sarah had problems accessing the audio lectures that were supposed to aid in the learning. As with Kathy, the audio files crashed Sarah's computer and made her give up on the experiment.

I wish I can hear it. It crashed my computer. I have Mozilla Firefox (pop-up blocker) and it downloads it. It got up to 40 percent and I had a virus on my computer. It crashed my computer. I didn't even get to listen to it I didn't get to listen to the second ones, because I didn't want it to crash my computer.

Sarah did not have much more success with the third batch of audio files that were uploaded in .MP3 format, which reduced the files to 6% of their original size.

I heard parts of it, but it was all mumbled. Even the new ones were just mumbled. I couldn't even really hear it. I could download them, but I couldn't hear them. My computer is messed up. It could have just been my computer not being able to read it. It might have been just that.

Like the other students in the class, Sarah was sometimes overwhelmed by the work load that came with the course. After receiving a 62 on the first test, Sarah began to complain about the class stating, “It’s hard! It’s too much information at one time. It is like 150 pages on one test and it is really hard to study all of that material.” Sarah scored consistently poor in her three online exams (62, 69, and 62), but she managed to excel in all of the other assignments earning her a ‘B’ in the course, the second highest grade in this study. It was obvious that Sarah was happy with the improvements she made and was satisfied, but not ecstatic about the outcome.

I could have done better if I wanted to. I didn’t really know what to expect. If we had a practice test she would have known what to expect. It’s a ‘B’ for me in history and that is really good.

4.6 Justin Landry

Justin Landry was a potential participant who dropped out of the class and the study before midterm. Justin is a bright 20-year-old student with one online class to his transcript. He entered the class singing the praises of the relationship between technology and academia.

I think it’s good if it’s on a campus environment. I don’t agree with the whole University of Phoenix online. I would be hesitant to do that. I wouldn’t like that where my teacher is 500 miles away. Here on campus, with the Math, if I did have a problem with the 003, I could go to the actual instructor’s office, and ask her. That was open to us. So that made it more reliable.

Unfortunately, Justin’s euphoria did not last long. He dropped the history course after two weeks and one horrendous first exam. Justin’s performance on this test was the sole factor in his terminating the class and his ill will towards the course.

I studied for the test quite extensively. The material on the test was completely different from the material I studied. I didn’t like the way it was set up. I am very familiar with Blackboard, but the other course I took on blackboard was completely different. It was set up. It actually taught the material. The test questions were completely ridiculous. Plus the effort. I am sure I could make an A on one of those tests, but it would take me beyond a conceivable amount of time to study the material. Plus the study guide, plus the summaries. I did all that and I still did bad. It wasn’t anything like the questions that we studied or reviewed.

On the syllabus it said, “Study, read the text, read the outlines, do the discussion quizzes, etc.” I did all of that. I reviewed it extensively. I decided to drop it and take it in the fall with a lecture class. I think if I had been able to take notes in actual class, it would have helped. I really had the goal of making an ‘A’ in that class, but it would have been really hard making at ‘A’ after my first test score.

The test really had a negative effect on Justin, who considers himself a highly motivated student, and is planning to go to grad school upon completion of his psychology degree. Justin describes himself as a mature student, who at 20-years-old had already put his partying days behind him. He had taken History 102 prior to taking the 101 course this summer and had set the goal of making a perfect 4.0 in all his future semesters in order to bring up his current 2.6 grade point average. These are all reasons why the 47 on the first test was too big of a burden to overcome. In addition to losing Justin to this study, he may also be lost to the online learning environment. He feels the sting of this class and the first test has turned him away from distance learning for good.

I am never going to take another one. I think my experience of this class it just reversed my openmindedness of Internet and technology courses. I think traditional methods are much better for learning the material obviously, based on my own experiences. I can’t speak for anyone else. I definitely learn better than the blackboard set up in class. If it was an online course like the math I took I might consider it if it was the same type.

Due to his limited time in the course, Justin’s case is only listed sparingly throughout the rest of this research. He was not in the course long enough to take in all of the methodologies and experience. His obvious frustration in the above responses seemed to stem mostly from the test itself and not from any other portion of the online course environment.

CHAPTER FIVE. FINDINGS

Meaning, for a qualitative researcher, is always an incomplete picture. It is not so much the case that we do not have the right meaning. Far more often, we simply do not have enough meaning. Our picture of anything is always too simple. Rather than applying the simplifying moves of a scientist, we are the sort of empirical researchers who want instead to develop a more complex picture of the phenomenon or situation (Shank, 2002, p.7).

As stated in Chapter One, the fundamental question for this study was: What are the students' perceptions of their online learning experience in relation to their academic performance? Results of the academic scoring rubric for the student participants in this study are listed in Table 5.1. In addition to the basic numbers that this chart supplies, the findings will provide more of the learners' voice in determining their perceptions of their online experiences. Understanding learner satisfaction in distance learning is an important dimension in understanding the success of the course (Simonson, Smaldino, Albright, & Zvacek, 2003).

Table 5.1
Student Academic Performance Comparison

Participant	Learning Disabled	Grade Point Average (GPA) prior to Study	Number of "hits" in the online course	Final points accumulated in class	Final Grade
Chance	Yes	2.013	550	275	C
Kathy*	Yes	3.231	707	204*	W
Jordan	No	3.0	1,780	421	A
Taylor	No	2.286	3,474	304	C
Sarah	No	3.118	928	348	B

* Kathy dropped the course seven days before the final exam.

While the central question stated above guided the research, many other factors were studied that are involved in the different instructional strategies. These aspects of online education refined the central question and helped provide detailed components in discovering the

overall attitude and feelings that the participants had in this online learning environment. The topics that will be discussed in these findings include:

- Online course delivery methods and student efficacy
- Online learning format and students' feelings toward the course
- Students' involvement in the online learning process
- The isolation factors the students faced in the online learning environment
- The clarity of the online instruction
- How the online learning format affected the time the students spent on the course
- The students' satisfaction in their performance in the course

5.1 Online Course Delivery Methods and Student Efficacy

The online format has been found to provide students (with LD and without) a great deal of independence (Berger, 2003). An independent learner can flourish in an online environment, because it is simply themselves developing knowledge with partial help from the instructor or classmates. This assistance can come in different doses depending on how much the learner desires. The online environment is also suited for a shy passive learner, who may fail to communicate in a face-to-face setting and therefore miss out on being an active classroom participant (Palloff and Pratt, 1999).

The participants came into this course with varying backgrounds and varying expectations. In the case of Kathy, who has a learning disability and is both independent and shy, she can use these online courses to achieve her desired results. Despite dropping the course with a week left in the semester, Kathy still felt like she benefited from the delivery methods used in this course. While recognizing herself as a shy, passive learner in the face-to-face classroom, Kathy was an active member in the online community dialogue that this history course provided.

Give me something to do and let me do it. I am not a person that (if I) were in a class, I am not gonna raise my hand and I'm not gonna get into discussion too much. Online classes give me a lot of time that I can stay up late and do it. . I am the type of person that...don't give me something on the spot and have me write about something. If they give you an hour to do it, it would take me 45-minutes to try think of something to what I want to say and to write it and not have enough time to go over and proof read it to make sure you have no errors or mistakes. It just gives me more time to concentrate on what I need to do.

The use of the Internet to deliver the instruction provided independence for Kathy. In response to this greater independence, she was able be freed from having to rely on assistance from others, which in return increased her confidence in achieving her educational tasks (Ryba, Selby, & Nolan, 1995). Chance (LD) also indicated a fondness for the independence in this course. Chance stated throughout that he felt confident in achieving his goals in this course despite his poor performance on the exams.

Taylor, who prefers the online experience primarily for its convenience appears to be a person who has an abundance of efficacy in whatever environment she is placed. Taylor's greatest success in the class came on the last test, where she scored 15-points higher than her previous attempt. "My last test was probably the best test. The overall average was not good. I did learn stuff from it. I did learn stuff that I didn't know." As she indicated, finishing the class with a 'C' did not sour Taylor on her overall experience. She felt that despite her average grade she left the class knowing a lot more about world history than when she began the course six weeks earlier. And while the average 'C' will leave a permanent mark on her college transcript, it will not tell the whole story. Taylor accomplished her goal of increasing her knowledge in this difficult subject, as she stated in our initial interview, "What I learned in high school, I left it behind. I wouldn't mind learning more about history, because I am not a big history buff. I couldn't tell you anything."

Prior to this class, Sarah had “no worries” about taking her first online course as part of this study. Her goal before the semester began was to get an ‘A’ in the course, finishing up her undergrad, and then moving on to graduate school and a Ph.D. program. At the end of the course, Sarah received a ‘B’, but was pleased with her performance and pleased with the results of her virtual education.

I didn’t know what to expect. So I was thinking it was going to be really boring type stuff, but it was better than what I expected. I loved it. I liked it better than going to class, because I would have been bored and not paying attention. I actually learned. I got a ‘B’, I’m happy. I am never happy with my grades unless they are A’s and B’s. (If I get a ‘C’) I would wanna retake it just to make sure I get a better grade. I don’t like C’s.

Sarah, who had dropped an on-campus History 101 class in a previous semester feels more knowledgeable about the subject and feels ready to pass on this knowledge to others who may be taking similar courses.

I remember a lot of things. My sister, she is taking world history next school year. She’s in high school. She’s flipping through her book. She’s like, “I don’t want to do this.” I said, “you have the whole year to learn just this, I just had six weeks.” She’s asking me all of these questions when she has her homework; she’s going to use my book and my notes.

The student who I observed gaining the most confidence throughout the course was Jordan. Jordan entered the class coming off a bad experience in an online math class and lacked the self confidence that the other students exhibited. Scoring highly on the first two tests (93 and 89) offered Jordan a reason to be confident in accomplishing the tasks that were required for this course. As mentioned earlier, Jordan was the lone participant to have positive remarks about this course during the interviews conducted at the halfway point. Her positivity continued with each passing task and her confidence grew as the frustrations of her classmates mounted.

I don’t know how anyone could not receive a learning experience out of this course, unless they just did not do the work. To pass the tests it required many chapters of reading, taking notes, working on the study guides in the book and

Website. I learned a great deal and I feel I walked away with more than I started out with. All the tools were given to get as much as you wanted from this course.

While the apparent ease in the course structure gave Jordan confidence, another reason for her feeling of effectiveness was her success in the essay and Discussion Board assignments. In the nine other assignments in the course besides the tests, Jordan only lost a total point out of a possible 150.

The use of computer technology and the asynchronous nature of the Internet have provided an independent outlet for these students. Studies have shown that students with LD have an increased willingness to self-disclose online (Bricout, 2001). The computer has brought about the benefit of independence to students where the individual can learn at her or his own pace (Berger, 2003).

The results of the students with LD, Kathy and Chance, were similar to the other students in regards to the online course's delivery methods and the students' efficacy. The parallel results were a common theme in the research question findings for this study. Despite the proclamation of their learning disabilities, few other indications of Kathy and Chance's disabilities could be identified based on the results of this research. The lone area in which differences were detected were in the less number of classmates' posting that Kathy and Chance read on the Discussion Board compared to the other participants.

5.2 Students' Feelings towards the Online Learning Format

Since Sarah was the only student to never take an online course before, I will start with her feelings towards the online learning environment. As mentioned earlier, Sarah had previously taken and dropped a face-to-face History 101 course due to a bad experience with the instructor. This familiarity did not help Sarah in the class and in fact it made her "scared of history". Her

online experience in this class left her feeling better about the content matter that she previously feared.

I am more interested in it (history). I don't like the ancient stuff, but I am little more interested in more ancient things than I used to be. I liked it better, because if I would have went to class, I wouldn't have paid attention. I would have been like "let's hurry up and get this thing over with." I wouldn't have paid attention and this was like I was forced to. 'Cause I teach myself in order to get a grade.

This process of teaching yourself independently was one of the highlights of Sarah's time spent learning online. She ranked the independent learning factor as the second most important feature of her online experience, after the Discussion Board.

This independence also affected the students with LD in this study in providing a more satisfactory learning experience for Chance and Kathy. Computer assisted independence has been observed through numerous cases where students with learning disabilities benefit by learning at her or his own pace (Berger, 2003). Chance felt the course allowed him to work at a pace in which he was comfortable. He also held similar views to Sarah in stating that his pleasure of the online delivery came in part from not having to sit through a typical college classroom sermon, "It was much better than going to class everyday. I thought it was great not listening to a lecture."

In comparison to Sarah and Chance, Kathy had taken numerous (seven) online courses heading into this study. While this class was structured differently than previous Internet-based courses she had taken, the format of the course was barely noticeable to Kathy. She felt the limited instruction online had little impact on her outlook on distance learning than when she entered the class.

I don't think I have any different feelings than what I had before with it. This history class was similar to my biology class. You just did a lot of reading offline and you went back online and answered what ever kind of questions he had pertaining to a certain sections in the chapter. My other (online) classes were kind

of different than that. My computer class, you were constantly online doing something. The things you needed to do were all online. With the history and the biology, you did more of your reading offline.

The primary feelings that Kathy felt for the course did not come from the online format, but from the tests that seemed to perplex most people in the class.

The course was alright. History is not my favorite stuff. I like online classes; I usually don't have any problems with them. I didn't like the point where the tests didn't have absolutely no questions from the study guide that was in these tests. I don't know why they even had the study guide.

Jordan had only taken online PLATO math courses before this summer and was pleasantly surprised with the advantages that the Blackboard platform provided. "Because of its easiness I find it gave me more confidence with online courses. The instructions were concise and easy to understand. Rarely did I ever have to post a question concerning the format."

Taylor had taken three online PLATO driven math courses and one speech course before this Blackboard history course, but also was unaffected by the learning format. Like Kathy, Taylor did not change emotions due to the course set-up and found that the majority of the course content occurred offline. "It didn't persuade me either way, because we took everything out of the book. There was nothing that we really did on the computer other than the discussion questions."

Kathy and Chance left the class feeling worse than the non-LD participants about their online experience. However, I feel their frustration was more directed at their academic achievement in the course and not the online learning format. The course design did not have a direct impact on their learning disability and their achievement. Kathy was continuously irritated by the textual readings and the test questions, while Chance seemed to be most upset by the subject matter in the course. Neither of these components is exclusive to the online environment. Both the heavy reading and subject matter are hurdles that would have to be cleared by Kathy

and Chance in a face-to-face world history course. The varying height of these hurdles is a potential topic for future studies involving online and onsite learning for students with LD.

5.3 The Students' Involvement in the Online Learning Process

The majority of the assessment in this course came from the three 50-point exams. The majority of the learning came from preparing for these tests. As such, the majority of the students' involvement in the learning process came in the way they handled their independent preparations for these tests. As was noted several times earlier, the first test in this class left a bitter taste in most of the students' mouths. With the class average at a 63, one would expect that after the first test the students in the course would take a more active role in the learning. The numbers shown from the course statistics reflect this to some degree. The average number of hits that students made to the history Website before the first test was 467 a day. That number increased to 705 hits a day between the first test and the second test. This total could have obviously been higher if some students like Justin, did not drop the class early on. The average number of hits decreased to 379 per day as students prepared for the final exam. This number is apparently skewed by the fact that four less students remained in class and the low number of students logging on in the final days of class as they focused mainly on reading the text and spent less time on the Discussion Board. A total of four students dropped the course leaving 15 students remaining at the end of the semester.

What these numbers possibly indicate is that the students in the class took a more cautious, and in return, active role in the course upon receiving low marks on the first exam. The numbers for the participants in this study showed no obvious differences. The number of hits simply reflected the total number as was shown in Table 5.1 with Taylor and Jordan logging on more than the other students.

Several participants also noted how their involvement in the learning process changed due to their performance on these exams. Kathy stated,

The first time I was trying to pull information out when I read the chapters. The second time, I thought. 'I really didn't have time to pull information out.' But after the first test I just tried to answer all of those short answer questions and essays that he had.

Justin, Taylor, and Sarah also felt blindsided by the first test. Sarah summed up their feelings saying, "Say what you need to look for to study, because the study guide doesn't help much. The outline on the (Norton) Web site helps better than the study guide."

Sarah also noted how her engagement in this virtual course had to be different than her previous experiences, which only came in the physical classroom.

If it was a lecture I wouldn't have been involved in it whatsoever, but since it was online and you have to because it was a grade I actually liked it. I like participating in that kind of way. I'm a shy person, so I am the one who sits in class and listens to everyone else's opinion. And this way I can say my opinion and nobody knows me. I don't like talking aloud in front of the class and this way nobody knows what I look like or who I am. I am just a person in the class. I liked participating that way. It made me feel comfortable.

Jordan, whose previous distance learning experience involved a different courseware and a different delivery structure, also had to behave differently in order to achieve at a higher level in this course.

Well since my only other online experiences had been through the math online courses, I feel this gave me a positive boost towards how I feel about online classes. In the beginning I was a bit nervous about taking another online class. I had struggled so much with math and felt very alone in my endeavor. This class afforded me another look at online classes. I felt connected to the online class and the teacher. I feel it was a much more positive experience.

Chance (LD) appeared to be the least involved student in this course. Since Chance was also the least involved student in the study and least assistive in the interview process it is difficult to accurately address the level of his involvement. Potential sources

of Chance's apathy could be his heavy course load, the religious content in the course, or in the fact that he got caught plagiarizing and did not feel comfortable discussing matters more thoroughly.

5.4 The Isolation Factors the Students Faced in the Online Learning Environment

Students in similar studies have stressed that asynchronous discussion board communication enhances the course work in online learning environments (Wilson, Cordry, & King, 2004). While Kathy noted how the online student is technically isolated during the course, neither she nor the other participants felt detached from each other during their six weeks together. The presence of the Discussion Board was the biggest aspect to maintaining the interaction between the students. The following are some of the comments that the participants made concerning the dreaded isolation factor that faces many distance learning students.

Sarah: (You are) not really isolated. You're just really a name on the computer.

You don't really know the person, but you're responding, so you are communicating.

Chance: (Experienced no feelings of isolation from his classmates)

Taylor: If I had a question and someone thought they could help me, they would respond. It helps as long as they knew something. If they did, they would jump on it. (Although) I think they should have an initial meeting. Not just a name.

Jordan: Through Discussion Board we had a chance to communicate with other students. Never was there a time that I felt at all isolated.

Jordan's comment concerning the Discussion Board was one shared by all of the participants. As I mentioned earlier, the Discussion Board feature was an overwhelming favorite of the students in this study. Table 5.2 breaks down the actual number of responses that the

participants in this study posted on the Discussion Board. The top row indicates the particular discussion thread, whether it is an assigned reading, a section to ask questions of the teacher, or just an open discussion for students to communicate. The number below each heading is the total number of postings in that thread for the entire class.

Table 5.2
Discussion Board Postings of Participants

	Reading #1 48 Total	Reading #2 40 Total	Reading #3 39 Total	Reading #4 41 Total	Reading #5 41 Total	Reading #6 46 Total	Q's for teacher 83 Total	Open Discussion 18 Total	Total
Chance	2	2	2	2	2	2	0	0	12
Kathy*	2	2	2	2			11	2	21
Jordan	2 (2)	2 (2)	3 (1)	2(1)	3 (2)	2 (2)	3	4	21
Taylor	2	2	2	2	2	2 (1)	13	3	28
Sarah	2	2	2	2	2	2	3	0	15

* Kathy dropped the class on July 7th, before the final two readings

One of the key findings from Table 5.2 is how Jordan, the lone ‘A’ student in this study went above her classmates in submitting and responding to postings in the content area questions on the Discussion Board. In the six assigned readings in the class, Jordan was either the first or second student in the class to submit her response. These numbers are indicated in parentheses above. In the sixth assigned reading, Taylor was the first student to post her answer, followed by Jordan. It is also interesting to note that Sarah and Chance were typically two of the last students to respond to the reading assignments on the Discussion Board. Kathy’s posting times fluctuated during her time in the course, but usually resided in the middle of the pack. The order of postings is viewable on the Discussion Board as Blackboard places the discussions in chronological order from earliest to latest.

The date and time of the postings could indicate aggressiveness or eagerness in the students who responded quickly. It also is a sign of an individual who is confident in the materials. From my own personal online experience, shy students or ones who are unsure of themselves typically wait until later to post their responses to an asynchronous Discussion Board.

This gives them an opportunity to read over their classmates' submissions ahead of time. Later postings are also read less often by classmates than earlier postings. This is due to students posting and responding to others early in order to complete the assignment and move on to something new. The idea of waiting for others to post first was also supported by Sarah who preferred to procrastinate in posting her discussion board assignments until she was able to read her classmates' discussions first. "You could read everyone else's response, so if you don't really understand what he is looking for you can kind of get ideas from everyone else if your not one of the first people to answer it." The concept of posting discussion assignments late is also strengthened by the minimal number of responses to later postings and also the indication of numbers of time each item is read, which is published by Blackboard next to each posting.

Another key finding from the postings on the Discussion Board is how most of the students in the study only made two postings to each assigned reading: one original response to the question and one reply to a classmate's posting. These two postings are the minimal requirement set by the instructor to earn points for these assignments. The only student in this study to respond more than twice to these assignments was Jordan, who twice made three postings. It is once again important to note that Jordan earned the lone 'A' grade out of the five participants.

On a side note, it is important to mention that only the three non-traditional participants in this study used the open discussion forum and actively used the thread to ask the instructor questions. Kathy (43-years-old), Jordan (39), and Taylor (34) all had a noticeably greater presence on the Discussion Board than did Sarah and Chance who were both 21-years-old at the time of this study. In this instance, age appeared to be a bigger influence on activity than did the students' learning disabilities.

The active participation on the Discussion Board also allowed the students to make virtual friends. Taylor and Kathy befriended each other after working together to figure out the audio problems. The two attempted to form a study team, but were unable to work out the logistics before Kathy dropped the class. Interaction like this is important when working in a technology-rich environment. Studies have shown an increase in student performance when interactivity is present (Cradler, 2003). However, other researchers (Simonson, Smaldino, Albright, and Zvacek, 2003) have noted that the forcing of interaction in distance education can be as strong of a detriment to effective learning as its absence.

Besides the feeling of helpful interaction that the students had with one another, they also felt undetached from their instructor, Dr. Hodson. Jordan, who was once again coming off a bad experience with online isolation, was pleased with the feedback that this course and this instructor provided.

I truly did not find any difficulties with the instructors. In fact, it was a nice change. With my math instructors there were always problems with getting an instructor to make time for my questions or concerns. There were many times emails were left unanswered. This [history class] has been by far a much more positive experience.

While everyone else agreed that Dr. Hodson's environment left the students feeling connected, they differed on just how connected they were to him,

Chance: Face-to-face is great when you have a problem.

Taylor: If I e-mailed him. He took him awhile, but he responded. He was there.

Jordan: The teacher proved very available. He normally had an answer or response within a day, no later than two.

Sarah: Dr. Hodson, he responds quickly to e-mails or the Discussion Board. He responds in like a day at least. It seemed like he checked it a couple times a day.

So you don't feel isolated, you just have to wait.

Kathy's only complaint concerning separation from the instructor came on the day when she was going to drop the class and she could not locate him. After an hour of waiting by his office, she finally got the proper forms signed. Kathy offered this compliment to the face-to-face experience when it came to dropping a class, "If he (Dr. Hodson) was in a classroom he would have been right there to sign it."

Despite this tongue-in-cheek remark, it is clear that Kathy, Chance, and the other participants enjoyed the asynchronous nature of the communication of this course. These feelings reflect similar research that found the use of computer technology and Internet interaction provides an independent outlet for students and has allowed students with LD an increased willingness to self-disclose online (Bricout, 2001).

Despite the potential benefits that online communication can have on learning (Brown, 1997) too often distance education courses offered over the Web are nothing more than electronic textbooks, which force students to navigate through a plethora of content, and thereby fail to utilize the medium effectively (Peraya, 1999). Palloff and Pratt (1999) stress the importance of modifying traditional teaching and practices when conducting courses and communicating in cyberspace.

5.5 The Clarity of the Online Instruction

When developing an online course, most virtual educators feel you need to begin with a strong syllabus, which will provide direction in the course and avoid later confusion (Palloff & Pratt, 1999). Other researchers feel the need to have some face-to-face meetings or orientation (Bonne, 1996). Taylor, who was the most vocal proponent of the initial class orientation, found little difficulty in comprehending the material. Taylor stated that there was no confusion with

Blackboard or with the instruction delivered in the course, “It was clear. I don't think there were any problems with what he expected.”

Jordan also noted that Dr. Hodson’s direction was “clear and concise.” She was even perplexed by the confusion that some of her classmates had to what she considered mundane problems.

It amazed me how there were a few students that asked questions that had already been addressed through the instructions. It was a nice change for me to completely understand the instructions and not have very many questions for the instructor.

Jordan, who performed well in the course in virtually every area, thought that if any confusion was found in the course, it was the fault of the receiver and not the instruction itself. She felt that if a student could not comprehend the information provided by the syllabus, the instructor, and the course itself, it was primarily a problem brought on by themselves.

Well, I think some students really need to pay attention to the dates given. Also, I think when you wait until the last possible moment to turn in work or take a test it opens the possibility up for problems. Should you have a questions or problem there is no time to have it addressed because you end up being late. I noticed a few that encountered such problems.

The course was a nice change for Jordan, who felt she got little guidance from her previous online course. Sarah had an early frustration with the test materials, but felt the instructor did a better job on the final exam, by incorporating more questions from the course study guide.

Test number three was a lot easier. He took questions from the study guide. I don't think people did as well as they should have. I did a lot better on it. I took it in like 20-minutes. It was very clear. It's like answering your Discussion Board. Answer questions and talk about the thing summarized. It is pretty clear.

Both students with LD found the instruction to be just as understandable as the other participants. Kathy, who is an avid follower of the syllabus, thought the direction was clear, but

would have liked a little more guidance as to what materials were going to be covered on the exams.

I would say the instruction was clear. He gave you what you had to read and told you to use the study guide. His [Discussion Board] questions and all were pretty straight forward. It was just the test was not. Probably the least important thing (from the text) was what he pulled out of that book for the test.

While not as vocal as Kathy, Chance simply mentioned that the course was just as clear and understandable as other courses he had taken, both face-to-face and online. He found little difference in the instruction and content delivery methods of this course. Apparently the clarity of instruction was not the reason for Chance's distaste for online learning at the completion of this history course.

5.6 Time Spent Due to the Online Learning Format

While online learning may reduce the travel time to and from class, it tends to require more "class time" than the traditional course (Presby, 2001). The students in this study had mixed feelings about how the time spent online with the history course compared to similar face-to-face courses, but most felt overwhelmed by the daily hours they actually put in to learning the materials. The amount of time that the students spent on this course did not necessarily equate to increased performance. Based on their responses, Kathy (LD) spent the most amount of time trying to learn the courses materials and still had to drop the class due to failing grades. The 4 to 6 hours a day that Kathy spent "reading, answering the study guide, and working on the assignments" had less to do with the online learning format and more to do with her learning disability.

Having to read five chapters in a short period of time.... I am not a fast reader. I like to take my time and really try to understand what I am reading and this is just too much at one time. It used a lot of my time up having to read those chapters. I think it was just the course itself and the amount you had to read.

Kathy made the comment that this course took away precious study time from her other class during the semester. In contrast, the other student with LD in this study, Chance, spent the least amount of time in this online course. Chance, who had two other classes during this summer session, did not feel his time spent in the history course took away from his other studies. Chance continued to feel this way even after he received a 'D' in both of those courses. It seems that Chance simply stuck to his routine and did not alter his study habits or his time spent on the course, which he said was between 1-2 hours a day.

Jordan, who academically performed the best in the group, stated that she spent at least two hours a day on the course. She said that her daily two hour ritual kept on her task to complete the heavy reading requirements.

It kept me focused to what I needed to accomplish. We had certain dates to respond, turn in essays and take the tests. These dates made me aware of the time I had to complete everything and give myself time to study.

Taylor, like Sarah, said she spent at least 1-2 hours a day reading. On days when she did not read, she would work on the essay and Discussion Board assignments. Although the majority of her coursework was done away from the Blackboard Website, Taylor still felt the online format was responsible for the additional time she spent in the class compared to the traditional face-to-face environment.

I think when you go online; you spend a lot more time than you do when you are in the class, because you are on your own. It was a lot for the summer. All the work, the reading essay questions, that was a lot in five weeks. I will say that.

Always the optimist, Jordan took a positive look at the time factor. Like most remote students who benefit from the convenience of avoiding the trip to campus for lectures, Jordan also felt relieved to be avoiding the trip to campus for tests for the first time in her online career.

I had been worried earlier on about days I'd need to take off work for tests and the final, but we luckily were able to take all of our tests and final online. With work

and children, this helped me out tremendously this summer.

The abridged summer schedule did affect the time spent on course for the students, who felt rushed to complete the assignments on time. Taylor, who had taken an online speech course the previous summer, left this class unsure if she would take any online courses again in the abridged summer session. She said that it would depend on the course and the amount of work that would go into it, "I'm not sure. Just not take it during the summer. The time frame wasn't there to read the material over again to try and comprehend more and more." Kathy, who contemplated taking the same course again in the fall, will definitely be avoiding similar courses in future shortened semesters, "I sure wouldn't take it during the summer that is for sure. Maybe the fall is different, because you got a bigger timeframe to do it all again."

Surprising, Chance (LD) held opposite views on this matter than Taylor and Kathy stating that the summer session was easier than taking the identical class during a regular semester, "I am very glad I did not take this class over the regular semester because of the amount of work." Some of these responses can be related to what Kozma (1991) found when he stated how students were more confident and willing to spend increased time with course content if the materials are delivered through computers.

5.7 Satisfaction of Performance

The satisfaction in this course can be marginally correlated to the grade received in this course and also the prior academic history of the students entering the course. In other words, if a student received a high grade, they tended to be pleased with their performance in the course. If a student received a grade lower than they had expected or had been accustomed to, they were dissatisfied with their performance. Most of the participants did not blame the online learning environment for their troubles, but simply the overall experience.

Kathy (LD), who entered the class with the highest GPA (3.23) of the five participants, ended up dropping the class due to low test scores. Kathy had high expectations upon entering the course due to previous online success and the fact that she was not working during the summer giving her more time to focus on her two classes. Kathy's feelings soured on her experience after leaving the class with a 'W'.

I don't like making the grades I made on there. I felt like I didn't know nothing. I don't like making D's. I could have hung with a C, but not a D. Those grades just drop your average too much.

As mentioned earlier, the bane of most of Kathy's frustration came from the heavy reading requirements and the confusion with the test questions. While this caused much dissatisfaction to her, it did not sour her opinion of online courses and distance learning.

Sarah was also a strong student with "no worries" upon entering her first online course. Sarah, a confident 3.118 student struggled early on, but wound up pulling out a 'B' in the course. The 'B' proved satisfactory to Sarah, who felt more accommodations could have been made to improve her performance.

It's a 'B'. I am happy with an 'A' or a 'B'. I could have done better if I wanted to. I didn't really know what to expect. If we had a practice test I would have known what to expect. It's a 'B' for me in history and that is really good.

Jordan, who had the third highest GPA entering the course (3.0) ended up being the most pleased with her performance, with good reason. Unlike the other participants, Jordan seemed to have a connection with the course finding pleasure in both the content and the context of the History 101 online course. Jordan seemed to discover early on what was expected out of the course and cruised in the class to a relatively unproblematic 'A'. Whether it was the high mark in the course that caused Jordan's satisfaction or the other way around, Jordan was pleased with her overall experience in the online learning environment.

I was satisfied with my performance. I wish I had done a bit better on the tests, but given just how many chapters we had to cover in the short time...I think I did ok. I didn't run into much that I found negative with this course. It was a course that you worked most of the time independently, and I found this no problem. After the first week I figured out quickly what I needed to accomplish each week in order to be on time with homework and be prepared for tests. I found with each week it became smoother and I became more confident.

Taylor, who entered the course with an average GPA (2.286), finished with an average score 'C' in the class. Likewise, Taylor felt she performed average in the course stating, "It was OK. I passed. I can see my way through. I wish I would have done better, but... I did learn stuff about history."

Chance (LD), who entered the class with a solid 'C' average (2.013), was not satisfied with receiving a 'C' in the course. Despite earning a 'D' in both his other two summer courses, Chance felt frustrated with his performance in history stating, "I would have liked a better grade." However, when asked about what he could have done differently or how the course could have been improved, Chance provided little additional information.

Based on the point totals from the instructor's scoring rubric used in this course (see Table 5.4), Chance and Kathy, the students with LD, scored the lowest of the five participants. These numbers can be deceiving though and may not truly indicate the students' overall performance. As was mentioned earlier, Kathy dropped the class with ten days and several assessments left. She could have conceivably scored well enough on these assignments to earn a high 'C' or a possible 'B' in the course. Before withdrawing from the class, Kathy's grades were similar to the other participants. Additionally, she would have unquestionably benefited from the instructor's last minute decision to drop each student's lowest test score. Chance also scored poorly on the rubric, but he failed to complete one of the Discussion Board assignments and received a zero on Essay #2 for plagiarizing. Both of these factors brought down his point total

and also attributed to his sour outlook towards the course. The idea of achievement and attitude will be discussed further in Chapter Six.

5.8 Media Findings

As was mentioned earlier in Chapter 3, several different instructional media were used to deliver course content in this study. These methodology components were based on prior research and were supposed to aid students with LD and students without LD in their learning. (See Table 5.3) The results of these components were mixed for both groups of students and showed no indication of helping out one group more than the other. Usually, all the students in the study tended to unanimously find the component to be either helpful or not helpful regardless of disability, age, or background.

Table 5.3
Media-enhanced Course Methodology Components

Learning Strategy of Students with LD	Media-enhanced Course Methodology Components
Regular assessments	Weekly Assessments
Time management	Use of calendar
Weekly/Monthly organizers (Reis, McGuire, & Neu, 2000) p. 129	Use of calendar
Online calendars and planners (Mull & Sitlington, 2003)	Use of calendar
Tape recorded materials (Heinman & Precel, 2003)	Audio version of lecture
Oral message (Pedrali & Rossano, 2000)	Audio version of lecture
Less reading (Ruzic, 2001)	Limited use of Discussion Board
Larger fonts and font colors (Mull & Sitlington, 2003)	Larger fonts and contrasting font colors

5.8.1 Weekly Assessments

The compressed semester for this summer course required the use of weekly assessments of the students' progress. The students had mixed feelings about the heavy workload in this course and the students with LD were more overwhelmed by the course reading requirements

than the weekly assignments. The participants thought the Discussion Board assignments were a nice break from reading the text. As Table 5.4 shows, the students performed very well with the weekly reading assignments selected by the instructor, but struggled in the objective multiple choice tests that were given three times during the course.

Most of the comments on the weekly assessments stemmed around the heavy reading requirements for this course and the fact that instructional time is compressed in the summer session making everything seem condensed and rushed.

Kathy: The weekly assignments were fine. In some other online classes, I had more assignments due. However, I wish we didn't have as many chapters to read at one time. That was the time consuming work.

Chance: It was OK. It could have been less work.

Taylor: It was a lot to do in a short amount of time. I find that reading the book and answering the questions would be enough let alone adding the essays to the load.

Sarah: The only type of weekly assignments we had were the one essay due every two weeks and the Discussion Board, which was two every two weeks. The load wasn't much compared to other classes, which would probably have given more. I could see this course having more assignments, but definitely no less.

Jordan: I didn't have a problem with the weekly assignments. Of course, I think had he gave us any more it would have been difficult to handle, given all the chapters we needed to prepare for our test.

The students did suggest having more than three tests in the course. This would result in fewer chapters to study for each test and fewer readings in preparation for these tests. The

participants suggested having one test a week with Sarah even going as far as recommending two tests a week. Since this was the first time Dr. Hodson taught this course in the summer, he found out through his own experiences with the course that more tests would be needed. He decided to divide the coursework into four or five tests in future summer offerings.

Table 5.4
Rubric of Course Assessments

Student Name	Test #1	Test #2	Test #3	Essay #1	Essay #2	Essay #3	DB #1	DB #2	DB #3	DB #4	DB #5	DB #6	Total Points
Chance	36	55	72	31	0	34	9	10	10	-	8	10	275
Kathy*	50	63	-	33	24	-	10	9	10	5	-	-	204
Jordan	93	89	80	33	33	34	10	10	10	9	10	10	421
Taylor	57	59	74	28	0	34	10	6	10	9	8	9	304
Sarah	62	69	62	33	31	34	10	9	10	9	9	10	348
Justin#	47	-	-	-	-	-	10	-	-	-	-	-	57
Class Average	63	70	72	31	26	33	9.4	9.2	9.9	8.3	9.3	9.5	295
Total Points Possible	100	100	100	33	33	33	10	10	10	10	10	10	449

* Kathy dropped the class with ten days left.

#Justin dropped the class immediately after the first test.

5.8.2 Calendar/Task

While studies show that online calendars and planners are a proven aid to students with learning disabilities in an attempt to stay focused and on task (Mull & Sitlington, 2003), only one student used this feature that was offered with this course. Sarah printed out the online calendar provided by the instructor through Blackboard and combined it with her own personal calendar and dates. The other students, for the most part, avoided the Blackboard calendar and used their own personal calendars and schedules as a way to keep track of important class dates and appointments. While Chance and Taylor avoided the feature altogether, Jordan decided to stick with her current routine.

The calendar and task menu were nice to have, but personally I used my own on Outlook. Since I'm at work for most of the day I just find it simpler to use this. Now had I been a full time student not working, I more than likely would have taken full advantage of these features.

Kathy chose not to use the calendar all together choosing her memorization and the course syllabus to keep her on schedule.

I never really went into that and fooled with that. I know he mentioned on the Web site about using it like a schedule or something. I kind of went in and looked at it, but I didn't fool with it. I pretty much know my due dates and then they're due.

5.8.3 Audio Lectures

The amount of literature focused specifically on digital audio is small. A consensus is that there is not enough substantiated research to develop any hard guidelines for the use of audio as a multimedia component in a multimedia environment (Beccue, Vila, & Whitley, 2001).

Despite the lack of positive literature in the area of digital audio, the instructor's audio lectures were still expected to have a positive impact on the students with learning disabilities. Earlier research had shown that an additional oral message has proven favorable in the learning strategies of students with learning disabilities (Pedrali & Rossano, 2000). The three course sections had several 2-5 minute synopses of the course materials in the instructor's own words to help students better understand the materials. While this use of computer delivered audio was intended to help the students with LD as well as their non disabled classmates, none of the students in the study found the audio to be of any assistance to their learning experience.

As mentioned earlier, Chance (LD) avoided the audio all together due to a lack of focus in listening to streaming audio on a computer. Kathy, the study's other student with LD, had technical problems early on, but later stated how she got nothing out of it and was expecting a little more. Kathy was even given a disc for the second group of audio clips, but was frustrated by technical glitches in opening the large files. With time being of the essence, Kathy spent too much of it trying to get the files to work, "I even went to where it said on there download it to

something else, but it would take forever, so I got out of it. It kept going and going. I need to really finish reading this book (to do better on the test).”

The other students in the study mentioned similar feelings to the audio lectures. Sarah could not open them due to technical problems. Taylor found they were too short to provide enough detailed information on the content. And Jordan found the technical distractions too much to deal with considering her limited time.

I didn't find the audio very effective in furthering my knowledge of the subject. Since I only have dialup I found the audio hard to hear and had many interruptions due to the speed of the modem. After trying it a few times, I did not continue.

Instructional designers dealing with making technology accessible for all learners sometimes have to develop media-enhanced instruction to the lowest common denominator or provide for a Plan B (Beck, 2001). Hefty files such as audio, video, and even large graphics might take a long time to download (or not at all) on a 56K or 28K dialup modem.

The Plan B for Dr. Hodson's audio lectures was to place the lectures on compact discs (CD). While the large files were too much for most home computers to handle, all of the students in the class were given the option of obtaining a CD of the lectures from the researcher. No students responded to this benefit despite the multiple accounts of difficulties accessing the files. The only student who received a CD was Kathy, who was given a CD after complaining about the audio during one of our regularly scheduled interviews together.

5.8.4 Discussion Board

While the lack of interest in the audio files was a shock to the researcher, the overwhelming interest in the Discussion Board proved to be similar surprise finding. As mentioned earlier, most of the students found the Discussion Board to be one of their favorite components about the online course. Research has shown that online discussions allow for

greater student-instructor and student-student interaction compared to conventional courses (Wang & Newlin, 2001). Wang and Newlin reported that the virtual participants have no discernable race, gender, ethnicity or physical disabilities. The instructors are represented similarly to the students, which provide a “non-intimidating environment where the playing field is level”. p.22

The participants in this study found the asynchronous discussion to be a nice way to interact and communicate with their faceless classmates. While using Discussion Board for the first time despite previous online courses, Jordan and Taylor both found the communication device to be effective in their overall experience. Both students spent a great amount of more time on the Discussion Board than did the other members of this study (see Table 5.5) and were active members of the virtual classroom communication.

Jordan stated, “Discussion Board was great. I feel it helped open up dialogue between students and even pushed further discussion on the various topics.” Taylor enjoyed the interaction the Discussion Board created, but also harped on the need for a beginning of class orientation for the students. “I like it. I like communicating with other people. I wish we had an initial meeting with everyone, so you would know who you are speaking. I like the Discussion Board to communicate with other people.”

Sarah, taking her first online course and unfamiliar with the online interaction, found the Discussion Board to be one of the bright spots in her experience in the course. At the completion of the course, she stated that the Discussion Board was what she liked best about the course and was the most important aspect to her online experience.

I loved Discussion Board. It was my favorite thing about it [about the course]. I like it ‘cause you get other people’s opinions and you have to read them, because you have to respond to them. You get other perspectives. I loved it a lot. There are

some of us that will sit in class that don't say anything, you're probably the person who has the best idea, and so I liked it a lot. I loved Discussion Board.

Despite the excess reading that Discussion Board requires of the students, the two students with LD in this class were in favor of its place in the online learning environment although they were not as ecstatic about the feature as Sarah. However, while enjoying the opportunity to gain more insight from her peers' point of view, Kathy had hoped that the information she was reading was more content based.

I wished it was more where they were going on about the chapters. Like at the end of the study guide they had essay and short answer questions, I wasn't sure if I had the right answer for those things and there was no key for them. I questioned him (the instructor) on it about how do you know if you have the right answers to the questions and he basically told me that we are on our own and to ask other students about it. I think if I knew I had the right answers it would help me out.

Chance used the Discussion Board primarily to read other students' problems and did not partake in most of the posting. He did find the communication instrument to be a nice discovery into the fact that he was not alone with his classroom concerns, "It was a great tool to find out information about the class that other students were having the same problem."

Table 5.5
Discussion Board Usage

	Content Readings	Questions for Instructor	Open Discussion	Total Responses	Total number of hits to Discussion Board *
Chance	12	0	0	12	340
Kathy	8	11#	2	21	497
Jordan	14	3	4	21	1,256
Taylor	12	13#	3	28	2,456
Sarah	12	3	0	15	665

#Taylor and Kathy had several discussions in this area concerning their audio problems

*These numbers are accumulated by Blackboard on the number of times a student reads or submits a posting to the Discussion Board.

Kathy and Chance's responses reflect studies that found students with LD choose to avoid social situations because of inaccurate self-assessments of their social competence rather than their actual social abilities (Gregg & Ferri, 1998). While Kathy and Chance did stress the

importance of Discussion Board, they spent less time reading classmate's postings as the non-LD members of the study (see Table 5.5). Kathy's numbers are skewed slightly because she left the class one week early and did not have to complete the final two Discussion Board assignments.

5.8.5 Text-to-Speech Software

Bisagno and Haven (2002) recommend the use of screen readers for all college students in order to provide for both visual and aural presentations of the material. Although there was limited required reading that took place in this course electronically, students were encouraged to use text-to-speech software packages for the textual materials provided online. As mentioned in Chapter Three, students were given information on how to obtain and use the free Read Please software package as well as using free screen reading software available on most computers.

Unfortunately, none of the participants attempted to use any of these text reading programs and never gave it much thought. Kathy, who did not recall reading information on how to obtain the CD of the audio lectures, also failed to notice the section on the course Website concerning the text-to-speech software. Kathy noted that she did not remember hearing about screen readers even after being asked about them in subsequent interviews, "I am not sure of what the text-to-speech software was for this course. Evidently, I did not use it."

Chance did not attempt to use any of the text-to-speech software mentioned. Instead he chose to print out the materials to read and to have his mother read them as well.

The non-LD participants in this study found little use for the text-to-speech programs and did not attempt to use it for any of the course materials.

Taylor: No, I didn't try it. Just never really thought about it. Does it work?

Jordan: No, I did not try the software. I don't have a problem with reading. I find I get more out of something reading it myself.

Sarah: I didn't use it because I didn't know how to get it. If I was told where I could get it, I forgot where it was.

5.8.6 Fonts and Contrasting Colors

Research also has shown that students with learning disabilities favor reading with larger fonts and varying font colors (Mull & Sitlington, 2003). Bisagno & Haven (2002) suggest enlarging the text to 18-point font and triple spacing the document. As was just mentioned, very little textual information was provided online during this course. The majority of the reading materials were with the textbook, the companion textbook Website, and the study guide. The only textual content provided in the online course was the three essay readings. The students all preferred to print out these documents to read on paper. Due to this and other difficulties, no variation was made in this course regarding fonts and contrasting colors. It is in the researchers' opinion that these would have made little if even noticeable impact on the students' feelings and success in this course. Maybe if more textual lectures were provided online, changes could have been made, but no such lectures were provided during this course. The majority of the course's reading taking place on the computer was on the Discussion Board and done by the students. As such, it was not possible to alter the aesthetics of these postings in any way.

5.8.7 Technology Problems

One of the concerns at the outset of this study was the potential for any technical problems that may have arisen during the six week course. As most people who work with technology would confess, glitches are common when teaching a multimedia course. Knupfer & Clark (1996) found that technology's "bells and whistles" often interfere with instructional design and befuddle the learning process. Since only two of the five participants were familiar with the Blackboard set-up, it was possible that technical concerns and confusion might affect

some of the attitudes and performance in the learning process. As most people know, technology problems do occur from time to time. It is worth noting in this study just how many problems occurred and how much did it affect the results.

Aside from the problems that the students had accessing the audio lectures and early problems noted with the textbook's companion Website (<http://www.wwnorton.com/wciv>), there was only one participant who reported having problems within the course's Blackboard site itself. Sarah reported that Blackboard kicked her off the site a couple of times noting that her session had expired including one time during test #3 after answering only four questions. She stated that this problem was corrected the next morning when the instructor reset the test for her.

Besides this and a couple of complaints from Jordan about the test moving slowly, there was little mentioned about the technology involved in this study. In fact every student, besides Chance, stated upon the completion of the study that they would take the same course again in the same delivery format by the same instructor.

The findings from this research are similar to the advantages and limitations of online learning found in previous studies. The instruction received is identical to that in a traditional environment, while the benefits of taking class anywhere and anytime make it more attractive to some learners. Issues like delayed feedback and bandwidth limitations are still a barrier to learning virtually (Simonson, Smaldino, Albright, Zvacek, 2003). Despite these limitations, the students were largely pleased with their online learning experiences regardless of their academic performance in the course. While their academic achievements were a part in their overall view of their experience, the convenience factor is what will keep them returning to the distance learning environment.

5.9 Online vs. Traditional Instruction

At the completion of this course, most participants stated they would take the class over again rather than take the same course in a traditional classroom with the same teacher. While everyone, except Chance, glowed about the benefits of online learning, some felt very strongly that it would have been a more academically richer experience had it been taken synchronously in a bricks-and-mortar classroom.

More than any other participant, Taylor felt that her online learning experience was not as plentiful as it could have been if she had been in the classroom.

I think it would have been better if we had him [lecture]. It might help explain some of the questions you may have on a subject, because hearing someone lecture, or reading, or discussing what has taken place. He could have taught us in a different way. He could have went more in detail as just different things that happened and not just reading straight from the book. I think I could have retained it better.

Despite this proclamation that she could have most likely learned more and more proficiently in a traditional classroom, Taylor would still take the online course over an identical face-to-face class if given the choice. This decision is shared by all of the students in the study and stems from the convenience factor that online courses provide. The convenience theme will be discussed in greater detail below.

Kathy was less confident that her learning would have increased had she taken the course in a traditional classroom. Despite having to drop out of the online format, she still feels the struggles she faced with the test would have still surfaced regardless of how the content was delivered, “I wonder. What's to say that when you meet up face-to-face that it would be the same thing? He (Dr. Hodson) is giving you a study guide and other stuff to study with and nothing is there on the test.”

Kathy felt that she got more out of this class due to fact that the learning was mostly

autonomous compared to the classroom experience, which causes independent learners to lose focus.

I very may have gotten more out of it than I may have in a conventional setting. With the online course I realize the importance of understanding and learning as much as possible. When I read I took notes and tried to pay attention to important facts. In classrooms during lectures it's very easy to let your mind wander...with online classes since you rely solely on yourself to get as much information as you can...you realize quickly the importance of everything involved.

Jordan entered and ended the class with positive feelings towards the online learning environment. Having an encouraging experience overshadowed her preceding concerns that were brought on by the troublesome math course she had taken previously.

I really don't think I could have learned more face to face. As I said, it takes a lot of reading and focus to gain everything you need to pass the tests. I feel it (online) only pushes you more to learn the information at hand. I personally did not have time to slack off...it's in your own hands if you want to succeed in this online course. I think I got just as much if not more from the online course rather than any face to face classroom. I'm giving up my own time and money to further my education; I have no desire to waste opportunities. I want to get as much as I can out of any class I take.

Sarah also felt like she got more out of the online delivery method than she would have gotten in a face-to-face setting. Having taken, and dropped, a History 101 course earlier in her college career, Sarah does have some personal insight into a comparison of the two. Although comparing the two would be like comparing apples to Apples, it is not disputable that Sarah enjoyed this experience more and would enthusiastically take it again.

I did a lot better, because like I said if I was in the class I wouldn't have done to well. I probably would have barely passed with a 'C' this I got a 'B' in so I did a lot better. I could have done better in this class, its just it was my first online class and I didn't know what to expect with the first test. I would have done better definitely online than on a lecture class.

While Sarah's antipathetic views are influenced by her loathing of the typical classroom lecture that she mentioned previously, her feelings also come from the convenience benefits that

the online learning environment provides. All of the participants in this study had some barrier that prevented them from taking the same course in one of its face-to-face offerings this summer. Whether it is distance, family, employment, or a combination of the three, the five participants all took History 101 online, because of the convenience it provided to fit around the rest of their daily lives. For Sarah it was work and distance. Even a part time job gets in the way of having to meet in a classroom every day for six weeks straight. The idea of not driving an hour to campus everyday and the experiences of her first online course have given Sarah new vision in her quest for her college degree.

It's harder, but it's easier, because you can do it whenever, but you have to teach yourself. I am taking one next semester. If any classes I need are online, I'll take them. It's better for commuters, because you can do it whenever you want. If you feel like doing it at ten o'clock at night, you can do it at ten o'clock at night. You are not obligated to show up for class, take notes in class, and go home and do your stuff. You can just do it right there whenever you want. You don't have to deal with going to class or waking up. You can do it whenever you want. I love online.

Taylor, who earlier stated that she would have gotten more out of a face-to-face class than she did in this online course, still prefers the virtual classroom to the bricks and mortar variety. During the interviews, Taylor made a constant effort to reemphasize that despite of its instructional shortcomings, online learning is still a great service for non-traditional students and students who can not make it to campus Monday through Friday from 7:30am-5:00pm.

The whole online is really good. I don't want to deter people from taking an online course, because it helps you. It is convenient for someone like me to go back to school. But face-to-face is probably easier or you could learn the material better. I can do it at my own pace when I have time. To work around my life and my kids. That helps me and people like me. It gives people other ways out. I can't go to school, so this gives me an option.

Kathy feels the distance education option is the only one she has available. After already taking eight online courses, Kathy said she will continue to do so as long as it fits around her

schedule of work and family. Kathy is scheduled to take three more online courses the following semester and was not discouraged in distance learning despite her experience in this course. Kathy stated she will keep on taking as many online courses as she can to avoid coming to campus since, “I have taken them before and never had a problem with them.”

Similarly, the convenience factor is the reason Jordan will be taking as many online classes as possible. Living and working over an hour away from campus, coming to school during regular business hours is not a viable option.

I’ll most likely continue with online classes as much as I possibly can. With working and being a parent, such classes have helped. I’m always worried when I sign up for a class on campus I won’t be able to make each date of class. Living such a distance away from (school) this affords me more of a flexible schedule.

More than any other student, Chance was the most enigmatic. He was the most difficult student to contact, the slowest by far to respond, and would often contradict himself with his interviews. For example, without giving a detailed explanation, he had this to say about his experience in this online course, “It was much better than going to class everyday” and “I dislike online class completely now.” I would have been lead to think that Chance simply enjoyed the convenience of the online environment had his feelings soured at the end with his grade, but his ‘C’ in the course was higher than his two D’s in his other face-to-face courses that he took during the same semester.

The students were mixed in their reaction to their online experience as opposed to an identical face-to-face situation. While some viewed that they could have received more information, others felt that the online environment was the best one for them. Overall, the students thought there would be no significant difference in their learning with either delivery method. However, the majority would take the online course over the classroom setting due to the convenience factor.

CHAPTER SIX. DISCUSSION

Learning is not enhanced because instruction is media based. Rather, the content of instruction, the method used to promote learning, and the involvement of the learner in the instructional experience were what influenced learning. Media are just conveyors of instructional methods and content; they do not directly influence learning in any way (Clark, 1983).

6.1. Media Debate

Most educational research that deals with technology-delivered instruction must begin and end with the “No Significant Difference” discussion. Richard Clark (1983) began this debate on instructional media over 20 years ago with the following statement.

There are no learning benefits to be gained from employing any specific medium to deliver instruction. The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievements any more than the truck that delivers our groceries causes changes in our nutrition.

The findings from this study cannot disprove this statement since I cannot clearly state that the use of online instruction had a direct effect on the students’ performance. Despite the fact that the use of the online learning environment was not shown to improve instruction, it did make the students relatively more satisfied with the experience. To put it in Clark’s terminology, the online learning format in this course proved to be a much faster vehicle that brought the groceries to the customers via a quicker route. The result was the same nutritional benefits, but more satisfied customers.

As other researchers have suggested, the results of technology’s effectiveness does not solely lie in improved test scores, but also in other important areas. McNabb, Hawk, & Rouk (1999) found technological-based advancements in students completing more complex homework assignments, taking more difficult electives, requesting particular teachers and

courses, declines in special education placements, increases in college applications, increases in student job offers, and more frequent parent participation. In this study the asynchronous online technology allowed the participants to take more courses, earn more college credit, and possibly graduate more rapidly due to the fact that they could more easily fit the distance courses into their schedules. This in return made them more satisfied with going to college and more eager to “go” to class. An important and often overlooked issue in distance education is understanding how students react to learning in a class where members are separated by time and space. Attitude toward distance learning is an important factor in eventual academic success (Reid, 1995). Some people worry that if educators and course developers fail to look ahead beyond these initial findings, “we will lose if we limit ourselves to disembodied interactions” (Dreyfus, 2001 p.51). Simply providing satisfied students or producing similar test scores does not necessarily equate to generating more complete individuals.

The purpose of the case study was not to provide definitive answers to the great media debate, but rather to allow for the inclusion of contextual conditions, as variables, that may be highly pertinent to the study’s findings (Yin, 1994). This research was not intended to be an end all solution to academia’s challenges in dealing with online learning or students with learning disabilities. The major purpose of this study was to create awareness of the experiences of an often overlooked segment of the college student population. We must be able to accurately identify the problem and describe the problem before realistically attempting to solve it.

The findings in this study supported several of the research studies on the topics of learning disabilities and online learning (Ryba, Selby, & Nolan, 1995; Anderson-Inman, Knox-Quin, & Symanski, 1996; Raskind & Higgins, 1998; Bricout, 2001; Berger, 2003). While this study’s two students with LD both struggled in this course academically, they both were satisfied

with their experience. The results in this study also revealed no significant differences in the findings of the two students with learning disabilities and their three non-disabled classmates. Usually, all of the students in the study tended to unanimously find the media component to be either helpful or not helpful regardless of disability, age, or background. No noticeable differences were found in the students' reactions and feelings toward the online environment and different methodologies in this course. The results did not appear to follow any particular demographic or group classification.

While one student with LD, Kathy, ended up dropping the course, her grades were similar to several of the other students in the study who ended up passing the course with Cs and a 'B'. Chance, the other student with LD in the study, finished with the lowest point total of the four remaining participants; however he also entered the course with the lowest GPA and had the heaviest course load of any student during the summer semester. It is my opinion that these other variables correlated to his poor performance just as much as his learning disability. In addition, Chance mentioned distaste for the religious subject matter that was discussed heavily in the course. It is my opinion, and that of the peer reviewer of this study, that no outstanding differences can be found in the attitudes and achievement between the students with learning disabilities and their non disabled classmates due to the online learning environment used in this study.

One of the more apparent disparities found in this study was not of the disability variances, but rather of the age discrepancies. While the age of the student did not raise any red flags in the academic performance of the participants, it did draw concern in the area of effort put into the course. As noted earlier in Chapter Five, the three non-traditional students in the study took a more active role in the class communication and even worked together to solve problems

in the course. Meanwhile, Chance and Sarah spent less time online, communicated less frequently in the class discussion, and appeared to be less concerned with their results in this class. All the participants in this study applauded the use of the Discussion Board and asynchronous communication. Only the non-traditional students used the communication tool to its fullest extent. Their active presence in the class discussion is similar to the role that non-traditional students play in the face-to-face classroom.

6.2 Online Learning vs. On Campus Learning

As I have noted repeatedly, this study is not a comparison of online learning versus traditional face-to-face instruction. However, it is difficult to judge the experience in the online learning environment without mentioning the in-class instruction with which most students are familiar. I do not attempt to directly compare the two here or even imply that one format is superior to the other. I simply intend to shed some light on how the participants felt they would have fared in an identical course taught in the classroom instead of through computer screens.

As Dr. Hodson noted earlier, it is difficult for him to compare his online courses with his face-to-face offerings which he feels are different approaches. While he had hoped that students in his online courses received the same education that his face-to-face students received, he was unsure if this was the case. The students in this study were also mixed in their reactions to their online experiences as opposed to an identical face-to-face situation. All the participants except Chance would wholeheartedly take more online courses. Justin's view was skewed by his mass confusion from the first test. Chance offered little insight into why he "dislikes online classes completely now". His other responses offered little information that supported this change. Throughout his interviews, Chance stated that the online course was "OK" and that he would have gotten the same education and experience out of a face-to-face class. Overall, the

participants in this study thought there would be no significant difference in their learning with either delivery method. However, the majority would take the online course over the classroom setting due to the convenience factor.

While the comparison of online learning and the traditional classroom style of instruction continues to be scrutinized in research similar to this, the actual use of technology to deliver instruction in this course was limited. The instructional technology in this study's history class was only utilized in four areas. The majority of the instruction in this course was delivered via textbook. The students only really used the online medium to 1) avoid coming to campus, 2) get course information, 3) post assignments, and 4) complain.

The main theme that kept getting mentioned at every turn by the participants was the great benefits that online learning provides them. Three of the participants lived about 60 minutes from the campus, three of them had children and family concerns, and all of them had jobs that made commuting to school difficult. These are the biggest reasons that these participants take and will continue to take distance learning courses. The asynchronous communication and independent learning are both nice functions of online learning, but the convenience factor is what keeps driving the students back.

While the technology provided the students the luxury of staying at home for class, it also provided a place where they can all meet virtually to get information. The Website provided information on what to read, what was due, when it was due, and what was expected of the students. While the paper-based syllabus is sometimes placed in permanent storage by many face-to-face students, the online course is a constant reminder of what is expected out of the remote students. In the history class, this is the place where the students went to see Dr. Hodson's announcements and to find out what changes had been made to the course schedule.

Dr. Hodson provided little additional instruction through the course Website. The students were told where to find the information and what was expected of them once they found the information.

The content for this course was mostly found in the course textbook with some additional readings that the students printed from the Website. Once the students obtained and digested this content, they used the media again to present their knowledge of the information. The Website was the gathering place of the students' knowledge. Whether it was the posting of the discussion answers, the uploading of the essays, or the online tests, the Website was the place where the students were assessed. In a face-to-face class, this would simply be done with synchronous technology in the classroom or by handing in the assignments to the instructor.

The other use of the media in this class was for the students to complain. The students all enjoyed the asynchronous virtual communication provided by the online format, but most only used it to complain about the tests, the Norton site, or the audio problems they were having. There was very little personal interaction taking place other than the few students assisting each other with their problems.

While the students utilized the open discussions on the Website to complain about the problems they were having, the discussions on the instructional forums were minimal. While Dr. Hodson required the students to respond to only one classmate in the six Discussion Board assignments, only Jordan went beyond that and responded twice on two assignments. Despite the fact that the students raved about the Discussion Board, they did not fully utilize the communication beyond the minimum requirements made by the instructor. These findings contrast a study of online learning communities, in which the students posted an average of five entries even though only two were required (Wilson, Cordry, & King, 2004). The students in the

Wilson, Cordry and King study mirrored the participants in this study by reporting “enjoying” the discussion sessions saying it “enhanced the course work”. However, unlike the five students in this study, these students put their feelings “where their mouse was” and posted them for all to see.

It is possible that the shortened summer course had something to do with the minimal dialog in this course. The crammed six-week semester meant students had little time between assignments to sit and reflect more on what was previously stated. After posting their initial responses, the students in the history course were forced to move on to the next reading and the next posting. Since the students were feeling rushed in this course, very little time was available to open up true communicative dialog.

6.3 Attitude and Achievement

Two related themes that kept surfacing throughout this study are in the areas of attitude and achievement. These two distinct, yet related areas were the backbone of this study from the onset. It is hard to search for one without observing the other. Attitude and achievement are the academic equivalent of the chicken and the egg. What comes first, the attitude or the achievement? While both questions may be rhetorical in nature, it would appear that it was the achievement that determined the majority of the students’ attitudes in this course.

While it is difficult to determine which students had the best attitudes either before or after this course, I will attempt to do so. Based on the interviews and body language, I would hypothesize that Sarah and Taylor entered the class with the highest expectations while Kathy and Jordan were the most skeptical. At the completion of the course, Jordan and Sarah were the most excited and positive about the course and their future online offerings. Taylor and Kathy were less thrilled of their involvement of the study and both felt that they might have gotten

more out of a face-to-face course. Of course, Jordan and Sarah left with high attitudes that correlated with their high marks of 'A' and 'B' respectively.

Chance was the most discouraged when the semester was finished, but he never seemed too thrilled about the course or the study from the beginning. Chance kept his feelings close to his vest and his answers in check during the study, making it difficult to get a clear picture of his true attitude before, during, and after the course.

6.4 Recommendations for Future Online Development

Based on the findings of my research, I have provided some recommendations for adopting online course to accommodate a variety of learning styles and preferences. Grounded in the literature, the results of this study, and personal experience, these suggestions are not presented as a one-size-fits-all solution, but rather a personal recommendation on how to design and deliver online instruction that best fits a variety of learners. The majority of the suggestions deal with the specific media that were used or attempted in the history course for this study. These recommendations deal more with the development of the course from an instructional design standpoint than with pedagogical implications.

While the audio lectures did not provide measurable benefits for the participants in this study, the use of auditory media to deliver instruction should not be eradicated. Once the file size issue was corrected, the major reason the students gave for not focusing on the audio lectures was the paucity of information. Future online instructors or developers should experiment with extended audio lectures that provide more information based on the content of the courses materials. Technical problems will continue to frustrate potential learners. Fortunately, most students will not waste too much time and dwell on these issues. They will simply move on to more comfortable content platforms that are provided in the instruction (i.e. textbook, lecture

notes). Through the use of compressed sound sizes and streaming audio, technical problems should be minimized on both the delivery and receiving end of the transmission. In the future, audio question and answer sessions should be conducted live over the Internet synchronously. A suggestion would be to create a format similar to a virtual chat room. Students can type in questions to the instructor while he/she responds into a microphone that is played or textually displayed on the remote students' computer monitors. With the current status of instant messaging technology, this feature could be standard in the near future. Since only the instructor will be answering the questions, minimal technology or bandwidth is required to achieve this communication.

Students with visual impairments or reading difficulties should already be aware of the text-to-speech programs currently available. Online teachers can provide some of these sites as links within their courses, but it is a personal preference for the learners and one that is more suited to be handled by the school's disability center. As shown in this study, even students who have difficulty reading prefer not to take the time to install and figure out these assistive programs. While the software is not as user friendly as the users would hope, instructors should still seek other options in providing audio alternatives to the text. Online instructors should check with publishers for supplemental CD-ROMs of text books as well as interactive Websites, and other resources in order to provide content in a variety of formats rather than just black on white text that comes with most online courses.

Black text on white background is still the norm when it comes to text books, Websites, and most other mediums that involve reading. Researchers should continue to explore various fonts and colors in their studies, but online instructors should use their own personal preference in straying from the norm. Educational researchers stress the importance of using larger sans

serif fonts and increasing the spacing between lines (Reis, McGuire, & Neu, 2000). However, this option should be left up to the individual students, who can increase the size of the text on most Web browsers or word processors. With so many variations of disabilities and visual impairments, it is difficult to select one shape and size that will fit all needs.

I also feel it is up the individual instructor to determine the extent of his/her use of calendar and task functions. While the research shows that these reminders keep the students on schedule (Mull & Sitlington, 2003), some instructors may not feel the need to provide a constant reminder to the students. If the information is in the syllabus and it does not change, then the students as young adults should be able to follow from that document without additional reminders. The process of putting the dates and times into most course management systems is a timely chore. A lot of online instructors would probably prefer not to spend any more valuable time inputting these tasks into the proper location on their sites. The demand for these functions does not appear to justify the heavy burden it takes to supply them.

This course did provide reinforcement to my beliefs in the use of frequent assignments in the online environment. The students in this study seemed to enjoy the consistency of the weekly Discussion Board postings, which kept them on track and engaged with the materials. I advocate using varying small assignments throughout the semester that will keep the students' interest and also provide them with an ongoing gauge of their performance during the semester. It is my experience that students who treat the online environment like a correspondence course frequently get behind in the learning process and find themselves struggling to keep up with the rest of their classmates. The use of regular assignments should provide consistency for them and allow the students to keep their focus on their studies. While the history course for this study

took place in an abridged summer semester, the use of regular assignments should still be considered for longer semesters as well.

Some of the participants in this study also stressed a fondness for an initial class orientation for online courses. They indicated that this face-to-face meeting would allow them to obtain an overview of the course and media in addition to having an opportunity to meet their instructor and classmates. In my current distance learning position I do not like the use of mandatory meetings for online classes. I feel it puts an extra burden on the students that are truly learning from a distance. However, I do condone the use of the orientation as a voluntary option for the students. Many online students find this meeting helpful in obtaining information on resources like the book store, library, and financial aid. Putting a face to classmates and teacher, and gaining first hand direction to the technology and structure of the course might also alleviate fears. These meetings may help in improving classroom retention, developing a virtual community, and avoiding future technology problems. Studies have shown that a combination of online learning and face-to-face meetings have produced positive results in the performance of students (Sorg, 2000).

These recommendations deal with some of the media that is involved in designing an online learning environment. Providing additional media may place an extra burden on the course developers, but their goal is to enhance the learning of all the students. These components can be added into the design of the course and will not isolate the students who require such assistive devices. A student who requires extra time on exams, recordings of the instructor's lecture, or a front row seat next to the board is not identified in the online environment.

6.5 Universal Design for Learning

The previous section dealt with suggestions in which online courses could be designed from a contextual standpoint. While a lot of research on learning disabilities and educational technology is focused on the use of assistive technology, these components should not be the save all solution for online instructors attempting to provide information to all learners. Assistive technology is designed to help individual students access the mainstream curriculum. Under most circumstances, the assistive technology is necessary because the mainstream curriculum is inflexible and inaccessible to that student without it. In the assistive technology model, the curriculum itself does not change, but the student uses a tool to help him/her access the curriculum.

In recent years, educators have adopted the phrase Universal Design for Learning (UDL) in reference to ensuring that the information is accessible to all students through the curriculum. In universal-designed environments, adaptability is subtle and integrated into the design. Designing for the divergent needs of special populations increases usability for everyone (CAST, 2005). The concept behind UDL is more based in pedagogy and curriculum than on media and technology.

One basic premise of UDL is that a curriculum should include alternatives that make learning more accessible and applicable to students with different backgrounds, learning styles, abilities, and disabilities. The "universal" in Universal Design for Learning does not signify that there is one single solution for everyone, but rather it underscores the need for inherently flexible, customizable content, assignments, and activities. Universal Design is not a "one size fits all" system. Effective UDL is meant to provide flexibility and the inclusion of alternatives to adapt to the myriad variations in learner needs, styles, and preferences (Rose, 2005).

While assistive technologies like video enlargers are expensive, awkward to use, and may isolate learners from their peers, integrating a UDL curriculum, on the other hand, would include a digital version of the textbook from the publisher that could be used by any student. The font and image size of that version could easily be varied to meet individual preferences of any student. Another variation of the material could be the provision of text-to-speech software that can read the text aloud digitally. No additional tools are needed (Rose, 2005). Individualized assistive technology can create a culture of failure for many students. UDL principles help educators customize their teaching for individual differences. A universally-designed curriculum offers the following:

- Multiple means of representation to give learners various ways of acquiring information and knowledge.
- Multiple means of expression to provide learners alternatives for demonstrating what they know, and
- Multiple means of engagement to tap into learners' interests, challenge them appropriately, and motivate them to learn. (CAST, 2005).

As UDL becomes more feasible and universal, assistive technology will no longer be required to make up for inadequacies in curriculum (CAST, 2005). Exclusive emphasis on assistive technologies places the burden of adaptation on the learner, not the curriculum. With UDL, the curriculum itself is flexible and customizable with scaffolds already built in.

Two instructional tools that can be added to any curriculum that would be beneficial for all learners are the use of guided notes and graphic organizers. Guided notes contain the main ideas and the related concepts of lectures as well as blank spaces for students to fill in during lectures. Guided notes may include key terms, phrases and are often derived from a teacher's

lecture notes. Research has found that all students benefit from the help of guided notes. In one study, students with learning disabilities and their classmates without any disability improved their average test scores when guided notes were distributed to the entire class (Frank, 1996).

Graphic organizers have also produced positive learning outcomes on students with varying disabilities (Hall & Strangman, 2005). A graphic organizer is a visual and graphic display that depicts the relationships between facts, terms, and or ideas within a learning task. Graphic organizers are also sometimes referred to as knowledge maps, concept maps, story maps, cognitive organizers, advance organizers, mind maps, or concept diagrams (Hall & Strangman, 2005). Graphic organizers have been widely researched for their effectiveness in improving learning outcomes for various students. Like guided notes, the use of graphic organizers can be positioned into the curriculum to make the information more supportive for the ever-changing variety of students.

Faced with delivering instruction to a variety of learning styles, many educators find ways of applying what is known to make their teaching more effective. Good educators are hungry for strategies, whether developed for teaching in the traditional or the online setting, that can help them teach every learner, everywhere, and at any time. UDL teaching and learning approaches are necessary in today's educational settings. Today's teachers are conquering the challenge of meeting the needs of diverse learners by making their curricula accessible to all learners.

6.6 Conclusion

The acquisition of knowledge and skills through reading has been, and most likely will always be, the most used method for delivering instruction. A great amount of reading is required in the online environment and in higher education in general. In the history course for

this study, the majority of the course content came from the textbook. Besides the brief and underused audio sound bites, the students did not receive the traditional sage-on-the-stage lecture that they have grown familiar with during their academic careers. In a face-to-face environment, students may rely heavily on the lecture to jot down important points and highlight what the instructor feels is significant enough to cover during class time. Students in a classroom have opportunities to ask questions and benefit from “real time” discussions to send out to others. The online students do not have these luxuries. The students in this study had no highlighted points to fall back on and had to rely on themselves to decide what was important and what was not. This apparently resulted in more reading than what takes place in the traditional classroom; and therefore, there can not be as much scanning over the materials in the online environment. Future studies could compare the amount of reading that is necessary for a face-to-face course compared to an identical online course. While the Internet and related technology continue to expand into the educational arena, the centuries old content delivery method of reading is not going away anytime soon.

Gary Shank (2002) states that qualitative research may be the best and perhaps the only valid way to build a genuine understanding of Internet culture. Like most qualitative research, this study is one person’s view of a complex case. As such, it is open for interpretation and replication. As mentioned earlier, limited research has been done in the area of postsecondary students with LD in the online learning environment (Gardner & Wissick, 2002) and relatively little research has accurately portrayed the effects that online learning has on all of its students.

With the Internet exploding into the delivery of academics within the last ten years, it is difficult enough to provide an accurate description of its methodologies much less indicate what effects these technologies have on student achievement. Virtual education is an exciting new

discovery, but one that will be enhanced constantly and will eventually appear outdated in its present form. However, it must be presented as more than a correspondence course. Online faculty must be properly trained and the quality of these courses should be monitored accordingly. Academic administrators should take a more vested interest in the quality of instruction that is delivered over the Internet. Certain benchmarks and standards should be placed to ensure proper instruction is being delivered. With the advent of digitizing tools, multimedia, and hypermedia software, it became possible to explore electronic alternatives to the normal tactile curricula using the concepts behind Universal Design for Learning. Online instructors should incorporate strategies related to UDL to promote interaction amongst the students.

Education is an exercise in constructing knowledge and skills. It requires a careful balance of support and effort. Universal Design for access provides the greatest amount of support possible at all times, while Universal Design for Learning requires careful attention to the goals of any given learning experience so that a balance of challenge and support can maximize the learning opportunity (Rose, 2005). The ideas involved with Universal Design for Learning could be incorporated into the curricula of both the online instructors and those in the traditional classroom setting. The concepts behind UDL can be coupled with the instructor's current delivery methods in an attempt to provide instruction that is accessible and enhanced for all learners.

This research provided insight into the thoughts and actions of college students enrolled in an online course. Hopefully this study can be helpful in presenting the viewpoints of these students who had learning disabilities and those with no disabilities. It is important for online instructors to understand the feelings and insights that these students bring into the virtual setting and to properly prepare instruction to enhance these strengths.

REFERENCES

- Allen, I, & Seaman, J. (2004). *Entering the Mainstream: The quality and extent of online education in the United States, 2003 and 2004.* The Sloan Consortium. Sloan Center for Online Education at Olin and Babson Colleges.
- Americans with Disabilities Act of 1990, Pub. L. No. 101-336, § 2, 104 Stat. 328 (1991).
- Anderson-Inman, L. (1999, July/September). Computer-based solutions for secondary students with learning disabilities: Emerging Issues. *Reading & Writing Quarterly*, 15 (3). Taylor & Francis.
- Beccue, B., Vila, J., & Whitley, L. (2001). The effects of adding audio instructions to a multimedia computer based training environment. *Journal of Educational Multimedia and Hypermedia*. 10 (1), 47-67.
- Beck, J. (2001, August). Building effective rich media: A best practice guide for designers and developers. *E-Learning*. 2(8) 18-20.
- Behrmann, M. (1994). Assistive technology for students with mild disabilities. ERIC Digest #E529. Retrieved on April 22, 2003 from http://www.ldonline.org/ld_indepth/technology/eric529.html
- Berger, S. (2003). Computers bring independence to the disabled. AARP, retrieved on April 4th, 2003 from http://www.aarp.org/computers-features/Articles/a2002-07-02-computers_features_independence.html
- Bisagno, J., & Haven, R. (Spring, 2002). Customizing technology solutions for college students with learning disabilities. *Perspectives* 28(2), 21-26
- Blackboard Inc. (2003). Blackboard version 6.0. Copyright © 2003. Blackboard and the Blackboard logo are registered trademarks of Blackboard Inc.
- Bogdan, R. & Biklen, S. (2003). *Qualitative research for education: An introduction to theories and methods* (4th Ed.). Pearson Education Group.
- Bonne, W. (1996). Developing distance education classrooms. *T.H.E Journal*, 24 (1), 61-64.
- Bricout, J. (2001, Spring/Summer). Making computer-mediated education responsive to the accommodation needs of the students with disabilities. *Journal of Social Work Education*, 37(2), 267-281.
- Brown, A. (1997). Design for learning: What are the essential features of an effective online course? *Australian Journal of Educational Technology*, 13(2), 115-126.

- CAST. (2005). What is universal design for learning? Center for Applied Special Technology. Retrieved on October 10, 2005 from <http://www.cast.org/research/udl/index.html>
- Clark, R.E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445-459.
- Cohen, F. (1992, March). Learning disabled students boost scores, self esteem. *THE Journal (Technological Horizons in Education)*, 19(8), 36-32.
- Cohn, P. (1998, September/October). Why does my stomach hurt? How individuals with learning disabilities can use cognitive strategies to reduce anxiety and stress at the college level. *Journal of Learning Disabilities*, 31(5), 514-516.
- Collins, T. (1990). The impact of microcomputer word processing on the performance of learning disabled students in a required first year writing course. *Computers and Composition*, 8, 49-68.
- Cowen, S. (1988). Coping strategies of university students with learning disabilities. *Journal of Learning Disabilities*, 21(3), 161-164.
- Cradler, J. (2005). Summary of current research and evaluation findings on technology in education. Far West Laboratory for Educational Research and Development. Retrieved on August 1, 2005 from <http://www.wested.org/techpolicy/refind.html>
- Cramer, S., Krasinski, S., Crutchfield, M., Sackmary, B., & Scalia, L. (2000). Using collaboration and the Web to implement CEC standards. *Teaching Exceptional Children*, 32 (5), 12-19.
- Creswell, J. (2002). *Educational Research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle, NJ: Merrill Prentice Hall.
- Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Cummings, R., Maddux, C., & Casey, J. (2000). Individualized transition planning for students with learning disabilities. *The Career Development Quarterly*, 49, 60-72.
- Dreyfus, H. (2001). *On the Internet*. Routledge. London and New York.
- Dylexic.com (2004). An introduction to concept mapping. Copyright iANSYST Ltd. Cambridge, UK. Retrieved on March 31, 2004 from <http://www.dyslexic.com/database/articles/print/conceptmapping.html>
- Eustace, K., Fellows, G., and Tsang, P. (1994). Mosaic/WWW experiences with library science students in a Macintosh computer laboratory environment. Retrieved November 2, 2000

from the World Wide Web: <http://tecfa.unige.ch/edu-comp/edu-ws94/contrib/eustace.html>.

- Fraenkel, J. & Wallen, N. (2000). How to design and evaluate research in education (4th Ed). McGraw Hill.
- Frank, R. (1996). 'Guided notes' increase test scores for learning-disabled students. The University Record, April 23, 1996. Retrieved on October 10, 2005 from http://www.umich.edu/~urecord/9596/Apr23_96/artcl21.htm
- Gardner, J. & Wissick, C. (2002, Winter). Enhancing thematic units using the World Wide Web: Tools and strategies for students with mild disabilities. Journal of Special Education Technology, 17(1) 27-37.
- Gerber, P., Ginsberg, R., & Reiff, H. (1992). Identifying alterable patterns in employment success for highly successful adults with learning disabilities. Journal of Learning Disabilities, 25, 475-487.
- Gorman, C. (2003, July 28). The new science of dyslexia. Time Magazine, 162 (4), 52-59.
- Greenbaum, B., Graham, S., & Scales, W. (March 1996). Adults with learning disabilities: Occupational and social status after college. Journal of Learning Disabilities, 29(2), 167-173.
- Gregg, N. & Ferri, B. (1998, September/October). Hearing Voices, Witnessing Pain: In response to "Why does my stomach hurt?". Journal of Learning Disabilities, 31(5), 517-519.
- Guckenberger v. Boston University, 957 F. Supp. 306, 974 F. Supp. 106 (D. Mass 1997) and 8 F. Supp. 2d 82 (D.Mass, 1998).
- Hall, T. & Strangman, N. (2005). Graphic organizers. Retrieved on October 10, 2005 from http://www.cast.org/publications/ncac/ncac_go.html.
- Heiman, T. & Precel, K. (2003, May/June). Students with learning disabilities in higher education: Academic strategies profile. Journal of Learning Disabilities, 36(3), 248-258.
- Hitchcock, C. (2001, Fall). Balanced instructional support and challenges in universally designed learning environments. Journal of Special Educational Technology, 16(4), 23-30.
- Hollenbeck, K., Rozek-Tedesco, M., Tindal, G., & Glasbow, A. (2000, Spring). An exploratory study of student-paced versus teacher-paced accommodations for large-scale math tests. Journal of Special Education Technology, 15(20), 27-36.
- IDC's worldwide corporate eLearning market forecast and analysis, 1994-2004 (2001). Retrieved on September 15, 2003, from <http://www.idc.com:8080>

- Individuals with Disabilities in Education Act of 1990, Section 602(a), 20 U.S.C 1401a) et. seq.
- Janiga, Sandra J. & Costenbader, Virginia. (2002, September/October). The transition from high school to postsecondary education for students with learning disabilities: A survey of college service coordinators. *Journal of Learning Disabilities*. 35, 5.
- Jimenez, J., Ortiz, M., Rodrigo, M., Hernandez-Valle, I., Ramirez, G., Estevez, A., O'Shanahan, I., & Trabaue, M. (2003, January/February). Do the effects of computer-assisted practice differ for children with reading disabilities with and without IQ-achievement discrepancy? *Journal of Learning Disabilities*. 36(1), 34-47.
- Kavale, K. A., & Forness, S. R. (1996). Learning disability grows up: Rehabilitation issues for individuals with learning disabilities. *The Journal of Rehabilitation*, 62, 34-42.
- Kelly, R. (July/August, 2000). Working with WebQuests: Making the Web accessible to students with disabilities. *The Council for Exceptional Children*, p. 4-13.
- Knupfer, N. & Clark, B. (1996). Hypermedia as a separate medium: Challenges for designers and evaluators. *Proceedings of Selected Research and Development Presentations at the 1996 National Convention of the Association for Educational Communications and Technology*, Indianapolis, IN.
- Kolatch, E. (2000, April 19). Designing for users with cognitive disabilities. Retrieved on April 22, 2003 from <http://www.otal.umd.edu/UUGuide/erica/>
- Kozma, R. (1991). Learning with media. *Review of Educational Research*. 61(2), 179-211.
- Learning Disabilities Association of America (1995, Jan./Feb.). Assistive technology for individuals with learning disabilities. Retrieved on April 22, 2003 from http://www.ldonline.org/ld_indepth/technology/ldafactsheet.html
- Leib, Jeremy. (1999, June). 1999 U.S./Canada Internet Demographic Study. *CommerceNet Newsletter: Facts, Figures and Forecasts*, 1(6), 1-4.
- Lerner, J. (1997). *Learning disabilities: Theories, diagnosis, and teaching strategies* (7th ed.). Boston: Houghton Mifflin.
- Levinson, E.M., & Ohler, D.L. (1998). Transition from high school to college for students with learning disabilities: Needs, Assessment, and services. *The High School Journal*, 82(1), 62-69.
- Logan, K. & Thomas, P. (2002, June). Learning styles in distance education students learning to program. 14th Workshop of the Psychology of Programming Interest Group, Brunel University.

- Lou, Y., Bernard, R., & Abrami, P. (in press). Distance education research and practice in higher education: A theory-based meta-analysis of the empirical literature. A manuscript submitted for publication in ETR&D.
- McNabb, M., Hawkes, M., & Rouk, U. (1999). Critical issues in evaluating the effectiveness of technology. The Secretary's Conference on Educational Technology, 1999: Evaluating the Effectiveness of Technology. (Washington D.C., July 12-13, 1999). ERIC number ED452827.
- Meister, J.C. (2000, April 3) Savvy e-learners drive revolution in education: The case for corporate universities. Financial Times, Business Education, page 1.
- Meyen, E. et al. (2002, Summer). e-learning: A programmatic research construct for the future. Journal of Special Education Technology, 17(3), 37-46.
- Mott, N. (2003). Transition services for first semester freshmen with learning disabilities. Retrieved on October 9, 2003 from <http://www.newfoundations.com/CurrProjects/Mott.html>
- Moore, M. (1989). Three types of interaction. American Journal of Distance Education, 3(2), 1-6.
- Mull, C. & Sitlington. (2003). The role of technology in the transition of postsecondary education of students with learning disabilities. The Journal of Special Education, 37(1), 26-32.
- Murray, C., Goldstein, D., Nourse, S., & Edgar, E. (2000). The postsecondary school attendance and completion rates of high school graduates with learning disabilities. Learning Disabilities Research and Practice, 15(3), 119-127.
- National Center for Educational Statistics (NCES), (2004, June). The condition of education 2004 in brief. U.S. Department of Education. p.18
- National Center for Educational Statistics (NCES). (2003, November). A profile of participation in distance education: 1999-2000. U.S. Department of Education 2003-154.
- National Joint Committee on Learning Disabilities. (1987). Learning disabilities: Issues on definition. A position paper. Journal of Learning Disabilities, 20, 109-108.
- Oliver, R., Herrington, J., and Omari, A. (1996). Creating Effective Instructional Materials for the World Wide Web. *AusWeb96 Conference Proceedings*.
- Palloff, R. and Pratt, K. (1999). Building learning communities in cyberspace: Effective strategies for the online classroom. San Francisco: Jossey-Bass.

- Parkinson, D., Green, W., Kim, Y., & Marioni, J. (2003, July/August). Emerging themes of student satisfaction in a traditional course and a blended distance course. *TechTrends*, 47 (4), 22-28.
- Patton, J., & Polloway, E. (1992). Learning disabilities: The challenge of adulthood. *Journal of Learning Disabilities*, 25, 410-415.
- Pea, R. & Rochelle, J. (1999). Trajectories from today's WWW to a powerful educational infrastructure. *Educational Researcher*, 26, 22-26.
- Peraya, D. (1999). Distance education and the WWW. Retrieved on October 11, 2003 from <http://tecfa.unige.ch/edu-comp/edu-ws94/contrib/peraya.fm.html>
- Presby, L. (2001, February). Increasing productivity in course delivery. *The Journal*, 28 (7), 52-58.
- Raskind, M. & Higgins, E. (1998, January/February). Assistive technology for postsecondary students with learning disabilities: An overview. *Journal of Learning Disabilities*, 31(1), 27-40.
- Reid, K. (1995). Students attitudes toward distance learning. Retrieved April 9, 2003 from <http://www.tcom.ohiou.edu/ouln/Stdtatt.htm>
- Reis, S., McGuire, J., & Neu, T. (2000/Spring). Compensation strategies used by high-ability students with learning disabilities who succeed in college. *Gifted Child Quarterly*, 44(2), 123-134.
- Rogan L. & Hartman, L. (1990). Adult outcomes of teaching disabled students ten years after initial follow-up. *Learning Disabilities Focus*, 5, 91-192.
- Rose, D. (2005). Universal design for learning: Associate editor column. *Journal of Special Education Technology*. Retrieved on October 10, 2005 from <http://jset.unlv.edu/15.1/asseds/rose.html>
- Rose, K. (1994). K-6 Students' Use of the Web: Working With On-line Guides or Experts. Retrieved November 2, 2000 from: <http://tecfa.unige.ch/edu-comp/edu-ws94/contrib/rose.html>.
- Ross, J. (2000). An exploratory analysis of post-secondary student achievement comparing a Web-based and a conventional course learning environment (Doctoral dissertation, The University of Calgary, 2000). National Library of Canada.
- Ruhl, K. & Suritsky, S. (1995). The pause procedure and/or an outline: Effect on immediate free recall and lecture notes taken by college students with learning disabilities. *Learning Disability Quarterly*, 18(1), 2-11.

- Russell, T. L. (2002). The no significant difference phenomenon. Retrieved October 1 2003 from: <http://teleeducation.nb.ca/nosignificantdifference/>
- Ruzic, R. (2001, April 13). Lessons for everyone: How students with reading-related learning disabilities survive and excel in college courses with heavy reading requirements. Paper presented at the Annual Meeting of the American Educational Research Association. Seattle, WA.
- Ryba, K., Selby, L., & Nolan, P. (1995, October). Computers empower students with special needs. *Educational Leadership*, 53(2), 82-85.
- Saba, F. (2000). Research in distance education: A status report. *International Review of Research in Open and Distance Learning*, 1(1), 1-9.
- Saracoglu, B., Minden, H., & Wilchesky, M. (1989, November). The adjustments of students with learning disabilities to university and its relationship to self-esteem and self-efficacy. *Journal of Learning Disabilities*, 22(9), 590-592.
- Shank, G. (2002). *Qualitative research: A personal skills approach*. Upper Saddle New Jersey: Pearson Education Inc.
- Silc, K. (1998). *Using the World Wide Web with Adult ESL Learners*. ERIC Digest. Washington, DC: [ERIC Clearinghouse on Literacy Education](#).
- Simonson, M., Smaldion, S., Albright, M., & Zvacek, S. (2003). *Teaching and learning at a distance: Foundations of distance education* (2nd Ed.). Upper Saddle River, NJ: Merrill Prentice Hall.
- Smith, P. & Dillon, C. (1999). Comparing distance learning and classroom learning: Conceptual considerations. *The American Journal of Distance Education*, 13(2), 6-23.
- Sorg, S. (2000). Institutional change through a Web enhanced course model. University of Central Florida. Retrieved on August 1, 2001 from <http://distrib.ucf.edu/present/FETCpresentation030100/>
- SPSS Inc. (2003). *SPSS for Windows*, Release 11.0.1. Chicago, Illinois 60606
- U.S. Department of Education, National Center for Education Statistics. (2000). *Postsecondary students with disabilities: Enrollment, services, and persistence* (NCES Publication No. 2000-092). Jessup, MD: Education Publications Center.
- U.S. Department of Labor, The Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: Author. ([EDRS No. ED 332 054](#))

- United States Internet Council (2000). State of the Internet 2000. Washington, DC: U.S. Government Printing Office. Retrieved September 15th, 2001 from <http://usic.wslogic.com/introl.html>
- Varela, F., Thompson, E., & Rosch, E. (1991). The embodied mind: Cognitive science and human experiences. MIT Press.
- Vogel, S., Leonard, F., Scales, W., Hayeslip, P., Hermansen, J., & Donnell, L. (May/June, 1998). The national learning disabilities postsecondary data bank: An overview. *Journal of Learning Disabilities*, 31(3), 234-247.
- Wagner, M., Newman, L., & Blackborby, J. (1993, April). Follow-up youth in transition: Secondary school and beyond. Paper presented at Learning Disabilities Association of America International Conference, San Francisco.
- Wang, A. & Newlin, M. (2001, August). Online lectures: Benefits for the virtual classroom. *The Journal*. 29(1) 17-24.
- Ward, D. (2003). Dyslexia. Library of Halexandria. Retrieved on August 1, 2005 from <http://www.halexandria.org/dward412.htm>.
- Wikipedia. (2005). Microsoft narrator. Retrieved July 7, 2005 from http://en.wikipedia.org/wiki/Microsoft_Narrator
- Wilson, J., Cordry, S., & King, N. (2004, November/December). Building learning communities with distance learning instruction. *Techtrends*. 48(6), 20-22.
- Yin, R. (2003). Case study research: Design and methods. Third Edition. Sage Publications

APPENDIX A
CONSENT FORM

1. Study Title: Designing Online Instruction for Postsecondary Students with Learning Disabilities
2. Performance Site: Nicholls State University, Thibodaux, LA
3. Investigator: Mr. Andrew Simoncelli is available for questions about this study, M-F, 8:00 a.m. - 4:30 p.m. phone: 985-448-4131; 985-209-5661(cell) e-mail: andrew.simoncelli@nicholls.edu
4. Purpose of the Study: The purpose of this research project is to perform a case study to provide a holistic portrait of college students in the online learning environment.
5. Subject Inclusion: The participants for this research will be undergraduate college students enrolled in a college history course. Half of the participants will be diagnosed as learning disabled, while the other students in the course will have no learning disabilities.
6. Number of subjects: 6 (three learning disabled; three non-learning disabled)
7. Study Procedures: The six subjects will be interviewed by the investigator at least three times for the purpose of this study. The first interview will be conducted prior to the start of the course. The second interview will be performed during the course semester, while the final interviews will take place upon the completion of the course. Additional interviews may be added during the study based on the results of previous research. Interviews with the course instructor will also be conducted to determine the students' performances in the course.
8. Benefits: Results of this study will detail the impact that different online instructional methods have on the learning disabled students' attitudes and learning strategies.
9. Risks: There are no risks involved with this case study
10. Right to Refuse: Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.
11. Privacy: Subjects' identities will remain confidential unless disclosure is required by law. Pseudonyms will be provided for the participants and location of the study.
12. Financial Information: Students will not be paid any compensation for their participation in this study.

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Institutional Review Board (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

Signature

(print name)

Date

APPENDIX B
INTERVIEW PROTOCOL #1

Q: What is your age and educational experience?

Q: What is your current job or situation?

Q: What is your prior experience with the online learning environment?

Q: If so, what were some previous problems or successes?

Q: What is your prior experience with the Internet and related technology?

Q: How would you rate the importance on the Internet and education?

Q: What are your educational goals? Do you set educational goals?

Q: What learning strategies do you possess? i.e. Repetition, verbal elaboration, organization techniques, association....

Q: What study strategies do you possess?

Q: How do you typically perform academically? Can you grades be accessed?

Q: How confident are you with your academic performance in the upcoming online course?

Q: Do you have trouble with extensive reading with courses in your college career?

Q: How do you typically perform in history or similar courses? Do you like the subject?

Q: Do you have trouble staying on task with courses in your college career?

Q: Do you consider yourself a shy student or an active learner in the classroom?

Q: How do you control time management in you college career?

Q: Have you ever used books on tape or text-speech software in school?

APPENDIX C
INTERVIEW PROTOCOL #2

Q: What was your perception to your online learning experience in relationship to your academic performance?

Q: How confident were you with your academic performance during the online course?

Q: How did the online learning format affect your feelings towards the course?

Q: How comfortable were you with the delivery methods in the online course?

---- separate individual delivery methods.

Q: Did the online format actively involve you in your learning?

Q: How did your involvement in the learning change during the online learning experiences?

Q: What isolation factors, if any, did you experience in the online learning environment?

Q: Did you feel isolated from your classmates or instructor in this course? Why?

Q: How clear and understandable was the instruction delivered in this online course?

Q: How did the online learning format affect your time spent on the course?

Q: Did you experience any technical problems accessing the instructor's audio lecture?

Q: How effective was this audio to your overall learning?

Q: What are your feelings concerning the discussion board feature on the online course?

Q: Did the use of the course calendar and task menu help you in achieving more in this course?

Q: Where you satisfied with your performance in the online learning environment?

Q: What difficulties arose in taking a course through the Internet?

Q: What difficulties, if any, did you have with this course?

Q: What difficulties, if any, did you find with not being able to see or speak to the instructor?

Q: How anxious were you to log on to this internet class?

APPENDIX D
INTERVIEW PROTOCOL #3

- Q: Compare your learning experiences from this online course to previous traditional courses.
- Q: How did the online learning format affect your feelings towards the course?
- Q: How comfortable were you with the delivery methods in the online course? No lecture? Textual? Audio?
- Q: How effective was this audio to your overall learning?
- Q: What are your feelings concerning the discussion board feature on the online course?
- Q: Did the use of the course calendar and task menu help you in achieving more in this course?
- Q: How do you feel the online experience affected your academic performance?
- Q: How confident did you feel about the learning experience during this online course? Why?
- Q: How were your feelings towards the course and subject matter affected due to the online learning format?
- Q: How did your involvement in the learning change during the online learning experiences?
- Q: Did you feel isolated from your classmates or instructor in this course? Why?
- Q: What difficulties, if any, did you find with not being able to see or speak to the instructor?
- Q: Did you experience any technical problems with this course?
- Q: How clear and understandable was the instruction delivered in the online learning environment?
- Q: How did the online learning format affect the time the students spent on the course?
- Q: How could this confusion be improved?
- Q: Were you satisfied with their performance in the online learning environment?
- Q: What would you do differently if you could do it again?
- Q: What study strategies did you find helped you out in this course?
- Q: What difficulties arose in taking a course through the Internet?
- Q: What difficulties, if any, did you have with this course?

Q: How did taking the course in the summer affect you?

Q: Do you feel you could have learned more if you had taken this course from the same instructor face-to-face? If yes, would you have rather taken it face-to-face?

Q: Would you take another online course again?

VITA

Andy Simoncelli is the third child and only son to Americo and Kathryn Simoncelli. His parents currently reside in Lockport, Louisiana, after brief stays in Alaska, New York, and their home state of Pennsylvania. Also in Lockport is Andy's son Chance. Chance is a bright 11-year-old, who is the next Simoncelli in line for his Doctorate of Philosophy degree.

Andy never fully reached his potential in high school or as an undergraduate finishing from both Central Lafourche High School and Nicholls State University in the middle of both classes. After completing his undergrad in mass communication in 1994, Andy went on to work at WWL-TV for five years in various roles. In 1999, a job in distance education brought Andy back to Nicholls where he has been ever since. Working in a university setting also returned Andy to the role of student. He received his master's degree in educational technology from Northwestern State University primarily through the Internet. Returning to school as a non-traditional student brought a new found determination to Andy. After taking a semester off from earning his master's, he began his pursuit of a doctorate from Louisiana State University.

Life is not just school and work for Andy; the things that matter most to him are his family and friends. He enjoys traveling, spending time with his nieces and nephew, and chilling at Marsh Madness. Andy hopes this dissertation and degree are just the beginning of a long and successful career of educating the masses and making the world a better place. If not, at least he got a doctorate out of it.