AN ANALYSIS OF GRADUATE AND UNDER-GRADUATE COURSES: LEARNING STRATEGIES, COMPUTER LITERACY, COMPUTER CONFIDENCE, AND METHOD OF INSTRUCTION

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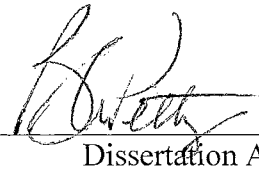

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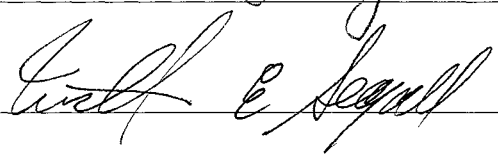

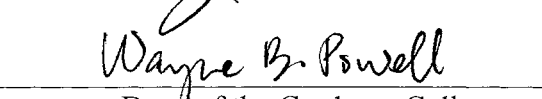

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The past ten years have been exciting for education. The availability and sophistication of technology has been unparalleled. Dyrli (1996) suggested that the continuing explosive development of computer-based telecommunications and the Internet have affected every aspect of our society, and education has been a primary beneficiary.

Educational technology has become a high priority on the national level. The Clinton Administration has successfully promoted legislation (a.k.a. The Technology Literacy Challenge) to make sure that technology reaches schools so that learners become prepared for the future. The Technology Literacy Challenge (T.L.C.) highlights four major points. First, teacher training has become the key to integrating technology into the educational process and to increasing student learning. Second, computers have become effective instructional tools only if they were readily accessible to students and teachers. Third, connections to the Internet multiplied the power and usefulness of computers as learning tools. And fourth, effective software and online learning resources expanded students' learning opportunities and skills (Roberts, 1996). This legislation was developed to promote the use of technology in education at all levels. As powerful new information options have become available and legislation has been developed at an accelerating pace, schools have been linked to homes, communities, and the world in ways that could scarcely have been imagined even a few years ago.

While the development of information technology accelerates, education professionals have found themselves buried under a deluge of more powerful and more complex instructional tools. As the Information Age explodes into the 21st Century, emphasis in the classroom continues to shift from teaching to learning, while the role of the teacher moves from instructor to facilitator. As informed professionals, most educators have been willing to try new technologies and to adapt to a variety of roles, but their success depends on accessibility to equipment, opportunity for technical training, and reliable technical support (Greenhalgh, 1997). While institutions of higher education have often been at the forefront in the conception and design of technology, more often, they lagged behind in its utilization (Karlen, 1994). Schools have spent a large amount of capital on distance education technology and infrastructure, with little funding being committed for content development, faculty time, and training (Jafari, 1997). This lack of funding and commitment to the support of faculty in integrating technology has caused instructors to fall behind. Also, students have been thrust into a chaotic situation because even when instructors are provided training in the use of basic technologies, they still struggle with integrating the technology into their curriculum.

This chaos can hamper a student's learning. Several studies conducted to evaluate computer literacy of students entering colleges or universities revealed that the majority of students only have some degree of computer knowledge. Their computer knowledge has usually been limited to skills in word processing. This has proven to be especially true for adult learners who have learned most of their computer skills at work where word processing was the most predominant use of a computer (Fine, 1991).

Adult students make up a large number of distance education students. In addition to adult students, there was a new age of students characterized in 1997 as cyber kids who are expected to enter college courses in the next few years. In his new book *Growing Up Digital*, Tapscott (1997) pronounced the new generation of cyber kids as "emotionally and intellectually open, innovative and one of free expression and strong view." He went on to say, "for the first time ever in human history, children are an authority on an issue of central importance to society." Student characteristics have changed and will continue to change. For this reason, online courses must be developed to meet the needs of the students. An article by Reid & Woolf (1996) referred to a number of studies that point to the need for developing new teaching strategies that accommodate a variety of learning styles including studies by Skalnik et al., 1996 and Gunkel, 1996. Also found in Reid & Woolf (1996) was a quote from Didelot which said "Recognizing that traditional and non-traditional learners approach learning tasks from different perspectives, development of Internet courses have been justified by the current shifts in teaching-learning paradigms related to adult education and hyperlearning education." A current review of literature suggests that faculty issues and learner issues related to online courses have received little attention in the past, particularly issues related to adults compared to young adults or undergraduate students compared to graduate students taking online courses. Also, educators have only recently "focused on" an understanding of the way students learn has become an important factor in improving educational opportunities for students (Dunn & Geisert, 1990). Because of the increase in the number of online courses, the changing demographics of students, and the new challenges for instructors, the topics deserve to be investigated.

Purpose and Objectives

The purpose of this research is to examine differences between undergraduate and graduate students in online courses and describe the learning strategies and methods of instruction used by instructors of online courses. The specific objectives are to:

1. Examine differences in levels of computer literacy of graduate and undergraduate students taking online courses.
2. Examine differences in confidence toward computer usage of graduate and undergraduate students taking online courses.
3. Examine differences in attitude toward computer usage of graduate and undergraduate students taking online courses.
4. Examine differences in learning strategies related to graduate and undergraduate students taking online courses.
5. Examine the learning strategies and method of instruction used by instructors of online graduate and undergraduate courses.

Research Questions

The following research questions were postulated for this study:

1. Does computer literacy differ as a function of type of student (graduate or undergraduate)?
2. Does computer confidence differ as a function of type of student (graduate or undergraduate)?
3. Does computer attitude differ as a function of type of student (graduate or undergraduate)?
4. Do learning strategies of instructors differ as a function of type of online course (graduate or undergraduate)?
5. Does method of instruction differ as a function of type of online course (graduate or undergraduate)?
6. Do learning strategies differ as a function of type of student (graduate or undergraduate)?

Limitations of the Study

The following limitations will be recognized in this study:

1. This study is limited to faculty and students participating in the online courses who took a part in this research.
2. This study is focusing on only a few learner issues related to the participation in an online course.

3. This study is focusing on only a few faculty issues related to the development of online courses.
4. This study is exploratory and can only be generalized to the population represented in the study.

Assumptions of the Study

The following assumptions will be recognized in this study:

1. Every person who fills out the questionnaire is a participant in the online courses selected for the study and will provide accurate information.
2. Every person who disseminated the questionnaire followed instructions given by the researcher to avoid bias and protect confidentiality.

Definitions of Terms

For the purpose of this study, the following terms are defined so that the researcher's intent is specifically understood. This study defines:

Undergraduate students: College students taking credit or noncredit courses who are 18 to 22 years old.

Graduate students: College students taking credit or noncredit courses who are over the age of 22 and have previously completed an undergraduate degree.

Online courses: Students hook up with other students and an instructor in both real and virtual time for the study of credit and noncredit curriculum from world-wide remote sites that are neither bound by time or physical location (Reid, 1996)

Computer literacy: Having a working knowledge of not only computer hardware and the uses of computers but also critical thinking and problem-solving related to the use of computers

Traditional classroom: The "Carnegie Model" of classroom in which students attend class on campus at a specified time each week and listen to a teacher present information or content of the course.

Internet: A collection of computer networks that exists free from local, state, national, or international regulation (Christenson, Hammons, Merrill, Reynolds, Tolman, & Vincent, 1996).

Distance Education: The existence of distance and time between the teacher (and/or information) and the students, using one or more types of communication media (Jafari, 1997).

CHAPTER II

LITERATURE REVIEW

Introduction

Technology and the use of computers in education have become a permanent addition to curriculum as we move into the 21st century. The focus in many schools today has become the importance of the utilization and integration of technology into the classroom. In order for students to gain knowledge of new technologies, teachers must be familiar with the advances and comfortable enough in their knowledge to teach children. A report by the Office of Technology Assessment stated that "making the connection between teachers and technology could be one of the most important steps the nation can take to make the most of past and continuing investments in educational technology" (1995).

Computers have now been in our schools long enough for concerned educators to conclude that some students, both young and old, do not "take to" computers. There have been a number of reasons for this, among them, no accommodation for different interests among students, different needs, or different learning styles (Partridge, 1993). Many have said that if these issues were taken into consideration, more students would "take to" the computer and this would enable those who do "take to" the computer to profit by and enjoy computers in education (Partridge, 1993). Students must have the opportunity to use technology and learn the importance of knowing about technology from instructors to be successful in the future. One study found that many students are currently computer

illiterate or have only mediocre computer skills, although, the number of computer illiterate students is decreasing with each passing year (Larson & Smith, 1994). Also, student characteristics have changed and need to be addressed by instructors.

Technology and society have changed too fast for many people to keep up (Baker & Baker, 1992). This has led to an increase in the number of adults attending college. Historically, many societies have equated youth with the ability to insatiably acquire information, and age with the ability to wisely use the information (Zemke & Zemke, 1988). R.B. Castell's research also suggested this is true- that wisdom is, in fact, a separate intellectual function that developed as we grew older (Zemke & Zemke, 1988). This two-faceted intellectual concept led to some curriculum development implications for instructors. When considering the complications that already exist for online course developers, online course development must change and be coordinated to address the changes in learners as well as the limitations and issues surrounding preparation for faculty.

The Changing State of Education

In its earliest form, distance education was the term used for study by correspondence, or what is now called "snail mail." As new technologies developed, distance instruction was delivered through such media as audiotape, videotape, radio and television broadcasting, and satellite transmission. Microcomputers, the Internet, and the World Wide Web are shaping the current generation of distance learning, and virtual reality, artificial intelligence, and knowledge systems may be next. Some have defined distance education as the use of print or electronic communications media to deliver

instruction when teachers and learners were separated in place and/or time (Eastmond 1995). However, others emphasized distance learning over education, defining it as "getting people--and often video images of people--into the same electronic space so they can help one another learn" (Filipczak, 1995), or "a system and process that connected learners with distributed resources" (Filipczak, 1995). These two definitions implied learner centeredness and control.

Traditional versus Online Courses

The system of American higher education has been in place for more than a hundred years. Historically, higher education has operated on the premise that a student spends four years living on a campus, insulated from home, work, and social environments outside the campus (Oblinger & Twigg, 1996). This type of education has changed. In general, students today still attend lectures (during which teachers proclaim specific topics), take notes, and read texts (Lambert & Riegel, 1994). However, the use of computer technology in the classroom has grown tremendously in the last ten years. Computers have increased to such an extent that the ratio of students to computers has dropped from 125:1 a decade ago to about 15:1 today (Dyrli & Kinnaman, 1994). According to Dr. Bob Roper, an educational researcher, approximately 600 courses are now offered on the Internet by 35 different academic institutions (Reid, 1996).

"The Carnegie Unit is no longer an appropriate model for structuring the classrooms of higher education," according to John Murphy, Senior Vice President for Institutional Affairs for the Apollo Group. Murphy argued that "advancements not only

in technology, but in the sciences of instruction and curriculum development along with assessment have made online instruction a desirable and efficient alternative" (Reid, 1996). The rapid proliferation of information and communication technologies has made it possible for the control of delivery to be removed from the hands of traditional providers—higher education institutions and faculty—and placed it in the hands of consumers or students (Oblinger & Twigg, 1996).

In the online classroom, students are held responsible for self-learning. Unlike a traditional classroom, in the online environment the instructor plays a more active role in facilitation of learning. Students are guided to initial points of interest and, whenever possible, students are given the opportunity to choose areas of Internet study (Reid & Woolf, 1996b). Electronic teaching and learning resources have extended the experience of students far beyond the time and space limitations of conventional materials or classrooms (Dryli & Kinnaman, 1995b).

There was no question that the immediate and probably long-term educational future of computer-based telecommunications has been web-centered. Immediate access to its global interlinked multimedia resources has connected teachers and students to "real-world" events as they happen, made individualization possible, and encourages collaborations that extend far beyond the classroom (Dyrli, 1996). The web has the power to enrich and extend every curriculum, and the potential to redefine schools (Dyrli, 1996). Three characteristics of information on the Internet distinguished it from traditional classroom materials such as textbooks, magazines, videos, and films. Information on the Internet was extensive, dynamic, and readily accessible (Hughes & Ryder, 1997).

Content of online courses has moved beyond books and blackboards to include moving images, text, and audio. Curriculum materials can be obtained at any time independent of a course and students can learn the material at their convenience (Oblinger & Twigg, 1996). Asynchronous attendance in the online classroom allowed for more frequent exchanges between student and instructors, thereby increasing the faculty-to-student contact hour ratio. It also strengthened interaction among all students, turning other students into important and continuing instructional/support resources. Online education programs thus have a great advantage over traditional education because they can overcome both time and place barriers and increase intimacy in the learning environment (Bjorner, 1993).

Massy and Zemsky (1995) pointed out two basic observations concerning information technology. First, the demand for information technology-based teaching and learning programs will continue to grow substantially, probably exponentially, over the next decade. Second, information technology will change teaching and learning profoundly, no matter what the responses of traditional higher educational institutions. Just as the development of the printing press forever changed the teaching enterprise, information technology represents a fundamental change in the basic technology of teaching and learning. To understand these changes, we must look at the learner and teacher.

The Typical Learner

Typical audiences for earlier generations of distance education were adults often seeking advanced education and training at home, on the job, or in the military whose

multiple responsibilities or physical circumstances prevented attendance at a traditional institution (Bates, 1995). Today, the situation is not much different. Enrollments in adult education classes have increased three times as fast as the United States population and represented the area of greatest growth in postsecondary education (Brademas, 1990).

Learners in Undergraduate versus Graduate Courses

The core market for traditional undergraduate education—18- to 22- year old residential students—has been shrinking (Oblinger & Twigg, 1996). In fact, *Faraway Thoughts* (1995) indicated that the number of 18-22-year-olds enrolled in full time courses has fallen by one-third since 1979. For this reason, higher education must compete in a nontraditional environment if it is to survive (Twigg, 1995). Mann (1993) indicates that to truly individualize learning experiences with technology for nontraditional students, we must:

- Get out of our historical mind-set and organizational boxes and take a broader and longer view of education
- Stop applying technology to old models and paradigms
- Develop new learning, information-access, problem-structuring, and decision-support models based on new technological alternatives

Kinnaman (1995) adds that confining distance education to the traditional classroom structure has resulted in a narrowly defined, one-to-many broadcast model that focused too much on delivering instruction and not enough on the intellectual engagement, participation, or progress of individual students.

The Growth of Adults

The nontraditional environment has been mostly made up of adults. A report from the Baruch Collete-Harris Poll (1997) states that 92% of 40- to 49-year-olds use the Net for education. Oblinger and Twigg (1996) assert that change is afoot in many traditional institutions. The situation is analogous to the late 1970s when enrollment declines were projected due to declining high school populations. Higher education became market driven as it sought to increase participation rates among older students, women, and minorities. Higher education has succeeded. By 1992, half of all college students were over 25, and one quarter were over 35 years of age (Hodgkinson, 1985).

Technological change provides another source for growth in adult education. Ongoing education and skill-renewal programs are the only way to stay on top of technological changes. Alvin Toffler said it years ago in *Future Shock* (1970) when he stated that "the rapid obsolescence of knowledge and the extension of life span make it clear that the skills learned by youth are unlikely to remain relevant by the time old age arrives." Toffler's observations are even truer today than they were almost three decades ago. The rapid changes in technology have become fundamental reasons more adults have returned to school (Baker & Baker, 1992). The most important reason for growth of college-bound adults has become the changing views as a society regarding education. Education has become more widely recognized as a lifelong process and a lifetime requirement for success and happiness. People live longer and things change faster (Baker & Baker, 1992).

Undergraduate versus Graduate Students in Online Courses

Adults seemed to match online courses better than traditional college age students (18-22 year-olds). Adults age 22-28 were categorized as "entering the adult world" by Levinson (1978). This stage of adulthood was considered the early or beginning adulthood stage (22-28 years old). In *The Adult Learner*, Knowles (1980) made four assumptions about adult learners versus younger learners. These assumptions included:

1. Adults tended to prefer self-direction while children were dependent on other sources.
2. Adults learned more effectively through experiential techniques such as discussion or problem solving than they did passive listening while children were subject-oriented rather than performance-oriented.
3. Adults were aware of specific learning needs generated through real-life experiences or events while children brought little to the learning experience.
4. Adults were competency-based learners, meaning they wanted to learn a skill or acquire knowledge that they could apply to their immediate circumstances, while children preferred a standardized curriculum for all.

Older students were more willing to question teachers and access received wisdom against their own experiences (Brademas, 1990).

Knowles (1980) cautioned that adults confronted with a classroom and 30 chairs facing forward know exactly how to act: like bored 12-year-olds. Knowles continued to point out that twelve to eighteen years of pedagogic conditioning could do that to a person. For this reason, adults could be ordered into a classroom and prodded into seats, but they could not be forced to learn (Zemke & Zemke, 1995). Knowles (1992) stated

that in his experience when people had the opportunity to learn by taking some initiative and perceiving the learning in their own experience, they would internalize more quickly, retain more permanently, and apply more confidently. Consequently, for designers of adult-learning experiences, the most dramatic alternative has been self-directed curriculum like the online course design (Zemke & Zemke, 1995).

Schools and colleges have begun to develop teaching strategies to change traditional classroom teaching. Self-directive teaching techniques have begun to prepare young people for their futures as lifelong learners and satisfy the needs of adult learners (Bohlin, Milheim, & Viechnicki, 1993-94). A small core of traditional learners, those who could afford it and those whose abilities have rewarded them with scholarships, have continued to seek out the traditional handicraft-oriented education. For these students, traditional education has provided acculturation as well as learning. However, the majority of learners (adults) did not have time or motivation to learn in this traditional manner. It was up to faculty to see the changes needed in education and make them happen.

Curriculum Development Changes Needed to Address Future Needs of Students

Institutions must embrace new formats for learning and new ways of measuring achievement (Brademas, 1990). Technology will no longer be a threat to the students as we move into the 21st century. Using technology to instruct imaginatively and tailoring learning programs to meet the needs of adult learners has played a major role in meeting the educational needs of today's students. Innovative and visionary uses of computer-

based learning systems such as online instruction have brought education within anyone's grasp (Berry & Main, 1993).

The development of distance education programs required more than a superficial shift from the traditional classroom instructional mode: it involved focusing on enhancing the assimilation and accommodation processes of the adult learner, types of technology used, and cost of the technology (Reid & Woolf, 1996a). The Internet offered new opportunities for students and teachers to learn in interesting ways (Ellsworth, 1994). Jafari (1997) suggested that one major characteristic of the Internet and web was its virtual worldwide connection that no other telecommunication technology could offer for distance education. The reservoir of Internet materials available to students offered a means of discovery and learning that often went beyond the immediate resource capabilities of the instructor or the institution's library (Reid & Woolf, 1996b).

Traditional Methods of Instruction

In traditional methods of adult instruction, teaching was "measurement driven" (Frederiksen, 1994). Measurement driven referred to the assumption that students were taught basic skills needed to pass a final exam at the end of the course. The result was that basic skills were chosen at the expense of higher order cognitive skills that might enable students to recognize and deal with problems in the real world. According to Frederiksen (1994), the increase in reliance on achievement test or standardized test scores in turn decreased academic emphasis in the educational process. A report by the National Assessment of Educational Progress indicated that the performance of students

on problems that required understanding and higher order thinking skills has declined (Frederiksen, 1994). So as instruction became skill-based, many instructors lost the ability to teach and motivate adults (Finnegan & Sinatra, 1991). It used to be assumed that curriculum controlled what was taught, and what was taught determined what was assessed. It now appears that, instead, the assessment has led both teaching and curriculum. For this reason, instructors have had to learn how to use problems to define teaching and curriculum that would build on the assessment.

Assessing Learning Strategies

Learning strategies are also important in curriculum development for the future of online education. For nearly two decades, educators have turned to the concept of learning styles as a means of exploring individual differences in learners with instruments to measure these differences developed by Kolb, Gregorc, Canfield, and Dunn. However, most of these instruments have inherent weaknesses. Consequently, many in the field of adult education have begun to explore the concept of learning strategies as a way to better understand these individual differences among learners. Contemporary studies with learning strategies suggest that distinct groups of learners do exist (Conti, 1996).

Regardless of the type of setting, learners use various strategies to accomplish their learning needs. Learning strategies are those techniques or specialized skills that the learner has developed to use in both formal and informal learning situations. They are techniques and skills that an individual elects to use in order to accomplish a specific

learning task. These strategies vary by individual and by learning objectives. Much of the research in the area of learning strategies has used the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS). New research has found that various groups of learners can be distinguished by the learning strategies that they use to adapt to different situations. ATLAS (Assessing The Learning Strategies of AdultS) has become a very effective instrument for categorizing learners by the learning strategies they use. This has become beneficial for instructors in non-traditional situations. The instructors could evaluate students' strategies and adjust their instruction to include strategies that were common to all.

Uses of Interactive Instruction through Online Courses

Teachers could use interactive learning to train learners to breakdown problems into their component parts and to set strategies for the solution (Fine, 1991). Tasks could be developed for the lesson in any way the student or teacher felt they should be. With interactive learning, there have been no guidelines to what information was given or in what order. However, it has become clear that students required hands-on experience. To hear was to forget, to see was to remember, but to do was to understand (Chute, 1993). For computers to be any more successful than traditional instruction, they needed to be in the hands of students with all of them actively engaged in using software tools in the development of their own creations. The real benefit of the computer was not in random access or even in individual interactivity but rather as a tool for creation and as a medium with properties beyond paper for communication. To promote peer review,

academic collaboration, and cooperative learning, the classroom must serve as an on ramp to the national and international data highways on the Internet (Chute, 1993).

By using sources on the Internet, lessons have become individualized. By individualizing the lesson, the student could draw from long-term memory and the learner could feel empowered. Empowerment gave an adult control over his or her learning; accomplishments became more meaningful (Finnegan & Sinatra, 1991). A student learned and worked at his or her own pace and on their own time (Fine, 1991). He or she could work independently to reach the goals they set for themselves. The teacher could therefore evaluate a student on an individual basis and change future lessons or steps to meet the students' needs.

Interactive learning could also be similar to the traditional classroom in the aspect of interaction with other students. Lessons could be adapted so groups could work together. This would allow students to develop ideas and knowledge while thinking about their own ideas as well as the ideas others. Also, it would allow students to draw on life experiences and to have others to learn from their experiences. Adult students could learn more effectively if they could relate the information to something they already knew or understood.

A collaborative learning environment that was computer-mediated could support some types of activities that were difficult or impossible to conduct in face-to-face environments, particularly if there was a large class. Collaborative learning meant that knowledge was not something that was "delivered" to students, but rather something that emerged from active dialogue among those who seek to understand and apply concepts and techniques (Hiltz, 1993). Simulations and role-playing were examples (Fine, 1991).

Or assignments where students had to research a selected topic using material not presented in the course to develop a paper or presentation. The overall conclusion was that online students learned the required material for a course as well as or better than students in face-to-face classes did. In a course where computer usage was intrinsic, the performance would tend to be significantly better (Hiltz, 1993).

An interactive learning environment could also feature integrated learning. This meant that adults learned more than just the content. They also learned about computers and the use of a computer. Adults seemed to feel more comfortable in a classroom full of computers because it felt like a work environment (Fine, 1991). For this reason, the atmosphere and ability to gain information other than the subject could overshadow misconceptions they had about traditional learning.

Changes for Faculty

Teachers had to change their instruction format if they were used to a traditional format of teaching. However, technology was never viewed as a substitute for the instructor (as some thought it would) because students could not be thrown into technology. To turn students loose at a computer to take an online course yielded little benefit; in fact, it increased their fear of technology (Sims, 1996). Instructors had to be there to guide and help students become competent. Online course technologies necessitated adjustments. Instructors had to acquire the knowledge to use the technology so they could teach students how to use it. The many roles previously combined in a single faculty member were disaggregated. Faculty had to specialize as developers of

courses and courseware wherein they moved from being content experts to being a combination of content expert, learning-process design expert, and process-implementation manager; as presenters of that material, as expert assessors of learning and competencies; as advisers; or as specialists in other evolving roles (Massy, 1997). By passing on the correct technological skills, instructors enabled adults to master learning on several levels simultaneously (Fine, 1991). Participants enjoyed interacting with the technology and became more engaged in the learning process as a result (Henschke, 1991). The course developer's knowledge of HyperText Markup Language (HTML), instructional technology design, and good research skills were needed if a course was to offer links to sites that expanded textbook readings and online activities (Reid & Woolf, 1996b). For this reason, computer literacy was important.

Changes in Instructional Techniques for Faculty

Instructors had to change in several ways to address the interactive learning environment in a positive way. Susan Rakes (1989) summarized several recommendations given by Steven Brookfield for successful adult-education classes. First, instructors had to be able to motivate learners. Motivation was necessary to keep students from getting frustrated with the technology. Studies on classroom computer use have consistently shown that computers motivated students- and both high and low achievers did well using them (Fine, 1991). Next, instructors had to learn how to develop learning formats that allowed for individual differences of students. In recent years, there has been increasing evidence that shows that all people do not learn in the same way. In

one important study, Martini (1986) investigated the effects of matching and mismatching instructional methods on the science achievement test scores of students according to their learning style. Data revealed that when students were matched and mismatched with instructional strategies that were complementary to and dissonant from their style, achievement and attitudes toward studying increased statistically. Of greater importance, data indicated that all students achieved statistically higher test and attitude scores toward learning science (.001) with computer assisted instruction. Thus, Martini's data verified the effectiveness of matching individuals' learning styles *and* the value of computer assisted instruction (Dunn & Geisert, 1990). There are many factors that affect the various learning styles. The increase in the ability to adapt different styles for different individuals necessitated the need for several different formats that would address the needs of everyone. The computer can support instruction for various learning styles, but high quality teaching must still be provided. Instructors must recognize, respect, and accommodate the individual differences of students and take time in selecting topics to be taught on computer (Partridge, 1993). Third, instructors had to learn to reinforce learning each day. The traditional students needed little reinforcement because they only needed to know facts. However, students in an interactive learning setting need to be reminded daily of important concepts to stay focused and on the right building block. Also, instructors had to allow class time for students to practice or go through lessons. The students needed a set of exercises that applied to the information for practice each class.

Instructors had to act as motivators in other ways as well. The instructor needed to encourage the students to be active participants. The instructor had to encourage

questions so life experiences could be brought out and shared with the class. The instructor had to organize lessons in a manner so that life experiences were brought out and the student could build on this knowledge for the next lesson. The instructor had a less active role in the class; however, he/she still needed to guide in the development of solutions or to answer questions concerning problems with the assignment. Most importantly the instructor had to show students how new skills and knowledge would relate to what they already knew and how this knowledge could be useful and meaningful to them. This meant relating theory to practice or relating a learner's field to other fields. By changing the way a course was conducted, instructors successfully integrated technology into curriculum and helped students avoid the frustrations that come with taking a course which includes technology but having an instructor who doesn't know how to use it.

Changes in Faculty Preparation for Online Courses

Dyrli and Kinnaman (1994) pointed out that it was important to remember that no technology-using teacher hits the ground running: Instructional changes occur gradually, and struggles with new technologies were a normal part of the implementation process. The point has been to make a defensible start in adopting technology and keep moving forward. However, Dyrli and Kinnaman say a professional goal for teachers should be to move deliberately beyond adoption of technology, toward adaptation, and then to appropriation of technology into the curriculum. They continued to say that technology

should not be positioned as just another content area in which learning about technology takes precedence over learning with technology (Dyrli & Kinnaman, 1995a).

Using technology to instruct imaginatively and tailoring learning programs to meet the needs of adult learners has played a major role in meeting the educational needs of students (Berry & Main, 1993). Adding imagination and creativity can make an online course worthwhile for adults, however, this takes extra preparation time and planning.

Hiltz (1997) stated that the future of technology is tied to overcoming some of the difficulties related to the current situation of budget cutting and increased course loads for faculty in higher education. The first difficulty has become the initial burden placed upon instructors to completely rethink the nature of their courses and adapt their teaching to a facilitative role. Faculty must receive training on how to utilize collaborative learning approaches. Also, since online courses required an increase in workload in terms of creating materials in electronic form, adequate motivations or compensation has to be provided. Otherwise, faculty felt that their efforts take away from time devoted to research, which has clearly been rewarded in the past through promotions and tenure. Such motivation to develop online courses has come in many forms, including more reduced teaching loads during the semester that a course was re-engineering for online delivery, or clear policies which rewarded such effort and innovation when promotion and tenure decisions were made (Hiltz, 1997).

Additional considerations for faculty as far as course preparation and planning must include a backup in the event of illness or worse. Someone else has to be able to step into the course and pick up instructional responsibilities (Essential Components, http://www.integralink.com/olel/soup.html). Modules have been developed to provide

support documentation at some universities. These define objectives, outcomes, and activities. Modules were comprehensive learning guides detailing what was expected of a student. These modules could be 100 pages in length and require a tremendous amount of time to prepare completely (Reid & Woolf, 1996b). These have been additions to the initial development time required because they were created in addition to course materials for backup purposes.

In addition to backup material, instructors must prepare technical backup in case of problems. Jafari (1997) suggested putting together a group of experts to help in the design and development of a web-based course. This gave the instructor a group of resources to help with problems. The four types of experts that were involved included: the instructor, an instructional design expert, a graphics and video producer, and a computer science expert or web master.

A focus on preventing problems ensures that the nature of an online course (available at any time) was not hampered. Necessary steps and preparation have to be taken to ensure full technical operation of the course at all times, day or night (Jafari, 1997). Production of web-based courses has been an ongoing task for developers. More time and knowledge was required to develop and maintain the online environment that students required. For this reason, computer literacy helped instructors become comfortable and productive throughout the process. An instructor without computer knowledge could cause confusion and frustration that could be avoided with training in the skills necessary to develop and maintain an online environment.

The Impact of Computer Literacy on Online Courses

As schools integrated technology into their courses, many have found obstacles such as computer literacy to be a problem. Instructors who were computer illiterate did not have the ability or skills to use technology in their curriculum. Students who were computer illiterate found technology interesting, but were scared to use it without proper instruction. Computer literacy was more than knowing how to manipulate a keyboard or mouse. For the 21st century, computer literacy means knowing how to think critically and ask the right questions (Chedester & Katz, 1992).

Computer Illiteracy among Students

Several studies have been conducted to evaluate the computer literacy of students entering colleges or universities. Most agree that the majority of these students only have some degree of computer knowledge. Their computer knowledge is usually limited to skills in word processing software. Today, a narrow scope of knowledge is not enough.

A study conducted at the University of Wisconsin found that entering freshman had some degree of computer knowledge. Word Processing was cited as the chief computer experience level among students. Over 60% of the students surveyed had no desktop publishing or presentation software experience and spreadsheet software knowledge was very limited. Most of the students in the study cited high school as their ultimate source of computer knowledge (Larson & Smith, 1994).

Another problem contributing to computer illiteracy among students was the fact that many computer skills were forgotten. A study done at East Carolina University found that about fifty percent of students had taken a computer course in high school or had worked on a computer either at home or at work. However, students had forgotten the program or software commands. The only software that students reported knowledge of after high school was word processing. The reason for the retention of word processing software was found to be related to students continued use of the software (Brown & Kester, 1993). This was also true for faculty.

Computer Illiteracy among Faculty

A study by the Office of Technology Assessment found that despite technologies available in schools, a substantial number of teachers reported they did not use computers and other technologies regularly for instruction. The study also suggested that many teachers saw the value of students' learning about computers and other technologies, but some were not aware of the resources technology could offer them as professionals in carrying out the many aspects of their jobs (1995).

Another problem with computer illiteracy among teachers was the fact that even when teachers were provided training in the use of basic technologies, they still struggled with integrating the technology into their curriculum. Fine (1991) indicated that interactive technologies necessitated significant adjustments, and a teacher could not only acquire the minimal knowledge to use the technologies effectively but had to stay up-to-

date with advances and technologies to keep pace. This put pressure on teachers because, for the past decade, integration of technology into curriculum has been a hot topic.

Lew Hofmann found many problems could arise when trying to integrate technology into curriculum using instructors who have little or no computer knowledge. First, as faculty progress toward computer literacy many times they fall behind the skills or knowledge of their students. Instructors were not learning to use the computer as quickly as students unless they taught a computer course (1991). This inability to learn as fast as students could be attributed to instructors' lack of time, age, or having no real reason to spend extra time on something that was basically trial and error.

Another problem that Hofmann found with instructor's computer literacy was that many instructors use the computer to do specific tasks. By using the technology for narrow reasons, they become more focused on only one aspect of the technology (1991). Teachers who use the technology on a daily basis for only specific purposes cannot build on the other areas in which they lack skills. It seemed evident that for a teacher to become computer literate they had to have resources to stay abreast of the latest technologies. Schools benefited by offering periodical training sessions for instructors to attend or from giving instructors more reasons to continue to use their knowledge and skills through Departmental tasks. Instructors were also being encouraged to become self-directed and use technology for more reasons than their usual specific tasks.

Conclusion

Education cannot predict how the rapid technological changes we have experienced will ultimately affect our organizations. The only certainty has been that technological change is inevitable (Rakes, 1989). A commitment to technology has been and will continue to be a commitment to change. Educators must develop strategies that take into account the reality of technological change and the factors that can determine its successful implementation.

Teachers must take the lead and be willing to invest the time and energy required to become as familiar with technology-based resources as they were with paper, pencil, or textbooks (Dyrli & Kinnaman, 1995a). School administrators must give teachers the lead role. This means that in addition to hardware and software resources, administrators must provide teachers with a professional climate that encourages and enables them to be inventors, creators, and developers of online courses. As Soloway (1995) put it, "if schools continue to emphasize the accumulation of information, continue to employ didactic instruction, and continue to view students as empty vessels that need filling, then students have no need for the rich information resources on the Internet."

Designing curriculum should not be a chaotic process. Educators should allocate adequate time and planning to the development process. Educators must plan for courses in a distance education model instead of a traditional classroom model. They must also develop courses that focus on the nontraditional student rather than the traditional student.

Online instruction programs must focus on adult students, most of whom are engaged in the world of work with an average age of 38 years (Bjorner, 1993). Because they are adults, courses must engage the concepts of self-direction, experiential techniques of instruction, real-life experiences, and application of knowledge to immediate circumstances. The Internet provides this type of environment with its rich pool of resources and constant, real-time availability.

In this computer-mediated environment, both the instructor and student must adapt to new roles. They must be computer literate and comfortable in the use of computers in the new environment. It will take time for both students and instructor to adjust, but in time the paradigm will prove successful and be easily adapted to learning and instruction.

Although this literature review reflects the views of what an online course should entail for all participants, it does not provide an accurate picture of what is really happening in online courses and online course development. Many studies in this literature review showed that online courses must be developed and presented differently than traditional courses and target a different population than traditional courses. Several studies also stated that online courses are better suited for adult students. However, no studies have been conducted to document the differences in traditional students taking online courses from adult students taking online courses. Also, there have been no studies to document the faculty preparation and planning differences for online courses that include a traditional audience and online courses that include a nontraditional audience. This research is important to the future of online education and deserves to be investigated.

Chapter III

METHODOLOGY

Introduction

This chapter identifies the method that was followed by the researcher to fulfill the objectives of the study. Research design, population and sample, data collection including instrumentation and procedure, and data analysis are included in this chapter.

Research Design

The research design employed a survey in the form of a questionnaire. Surveys are used in research to describe and quantify characteristics of a defined population (Monsen, 1992). The research survey was designed to identify the pattern of learning strategies an individual elects to use in order to accomplish specific learning tasks in a traditional or non traditional learning situation. A short survey was also given to identify computer literacy, confidence, and attitude in computer use of students. The dependent variables in this study are student learning strategies, instructor's learning strategies, computer literacy, computer confidence, and computer attitude. The independent variables in this study are undergraduate students taking an online course, graduate students taking an online course, and instructors teaching an online course.

Population and Sample

The population selected for this study was a listing of 90 online educational courses from CASO's Internet University web site and book. CASO's Internet resources were chose for several reasons. First, as Reid (1996) put it, "CASO's guide was designed so that users can easily choose courses spanning a broad range of disciplines. CASO has indexed documentation regarding the Internet courses including tuition, fees, and policies. The CASO Internet University Course Index was most impressive, breaking down course listings into twenty-four categories and giving a nice descriptive feature for each." Second, CASO's Internet University can be found not only online (www.caso.com) but also in a published book form making it accessible to anyone. In addition, two courses were selected from a list of twelve online at Oklahoma State University.

A random sample of twelve online graduate courses and ten online undergraduate courses were used for the study. The random sample was picked using a random numbers table. A number was assigned to each online graduate courses and each online undergraduate course. Using the random number table, numbers were chosen and then matched with the numbers assigned to each course. The matching numbers were selected for the study.

Data Collection

ATLAS Instrument

The ATLAS instrument was used for the study as the main data collection procedure. The ATLAS instrument was used for both instructors and students to analyze the various learning strategies used for the learning situation. The ATLAS instrument was produced as an instrument that was easy to administer (2-3 minutes), which could be completed rapidly, and which could be used immediately by both facilitators and learners. ATLAS utilizes a flowchart design. Items are presented on colored cards that contain sentence stems in a top box on the card. These sentence stems lead to options in other boxes which complete the stem. Connecting arrows direct the respondent to the options. Each option leads the respondent to another box which either instructs the respondent to proceed to another colored card or which provides information about the respondent's correct group placement. Five colored cards constitute the entire packet for the instrument (Conti & Kolody, 1998). For this study, each card was represented by a web page and placed online for participants.

Construct validity assesses the underlying theory of a test. Construct validity was established for ATLAS by synthesizing the results of in excess of thirteen doctoral research studies involving 3070 subjects using the SKILLS instrument and the consolidating the results. The SKILLS instrument was developed to measure learning strategies in the areas of metacognition, metamotivation, memory, critical thinking, and resource management (Conti & Fellenz, 1991). The construct validity for ATLAS was established by reviewing the literature of studies actually using SKILLS in field-based research and by consolidating the similar data from these studies. This resulted in the

identification of three groups-Navigators, Problem Solvers, and Engagers- with similar patterns of learning strategy usage that are established using the ATLAS instrument.

Navigators are described in the ATLAS survey as focused learners who chart a course for learning and follow it. Some Navigators like to use human resources for learning while others are more concerned with the organization of the material into meaningful patterns suitable for learning. Problem Solvers are described as learners who rely heavily on all the strategies in the area of critical thinking. Some Problem Solvers like to plan for the best way to proceed with the learning task while others are more concerned with assuring that they use the most appropriate resources for the learning task. Engagers are described as passionate learners who love to learn, learn with feeling, and learn best when actively engaged in a meaningful manner. Some Engagers like to use human resources for learning while others favor reflecting upon the results of the learning and planning for the best way to learn.

Content validity refers to the sampling adequacy of the content of an instrument. Content validity was established for ATLAS by using discriminant analysis to determine the exact pattern of learning strategies used by each group when it was compared to other groups. While ATLAS has only a few items, each item was based on the powerful multivariate procedure of discriminant analysis. Since this instrument is new, the developers are working on reliability tests.

Additional Instructor and Student Instruments

In addition to the ALTAS instrument, two instruments were developed for the study. One focused on the method of instruction used by the online course instructors.

The other focused on questions concerning computer literacy, computer confidence, and computer attitude of online learners. The instructors' survey and the students' survey instrument were developed through a literature review and by combining the survey items from four studies conducted over similar topics (Agho, A., Holm, M. & Williams, A, 1996; Bohlin, R., et al., 1993-94; Buhendwa, F., 1996; DeSanto, B. & Smethers, S., 1998). The instructors' survey instrument was designed to identify the methods of instruction used in the online course and items related to the development of an online course. This instrument was divided into two sections: method of instruction questions and questions related to the instructor's experience in online teaching and development of online courses. Section I consisted of twelve questions concerning method of instruction used in their online course. Section II consisted of 7 questions concerning the instructor's online teaching experience and issues related to developing the online course. This section also consisted of two optional questions that did not have to be answered by the instructor pertaining to their online course title and number.

The students' survey instrument was designed to identify the respondents' knowledge of computers, their confidence in using computers, and their attitude toward computers. This instrument was divided into two sections: demographic-type questions and a combination of computer literacy, attitude & confidence questions. Section I consisted of 6 questions concerning demographic information of students in online courses. Section II consisted of 53 questions concerning the respondents' perceptions of their computer literacy, computer confidence, and computer attitude. A six point Likert scale (1, strongly agree to 5, strongly disagree) was used to rank the students' responses to statements concerning their perceptions of their own computer literacy, computer

confidence, and computer attitude. In development of the 53 survey questions used to analyze computer literacy, computer confidence, and computer, the researcher analyzed each question separately and found 15 questions in the negative voice instead of the positive voice. For this reason, the researcher reverse coded the 15 items that were constructed in the negative voice to ensure proper analysis using the survey. The following survey questions were reverse coded: 7, 9, 10, 13, 14, 19, 21, 22, 26, 29, 31, 34, 53, 54, 58. The Cronbach Alpha Test of Reliability was used to study the properties of the measurement scale and the 53 items that made it up. The Cronbach Alpha is a test of internal consistency, based on the average inter-item correlation. The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. The alpha for all 53 items was .9592. The researcher then split the survey into each category (computer literacy, computer confidence, and computer attitude) and tested the items in each category separately. The alpha for the computer confidence items was .8152. The alpha for the computer literacy items was .9544. The alpha for the computer attitude items was .7678. The analysis for the computer attitude items showed that by deleting question 46 the alpha would be raised to .8431. However, because the reliability of the overall instrument was high (.9592) and the change from deleting the item would be minimal (.0753), the researcher decided to leave the item in the survey.

The instruments were pilot tested using a graduate online course offered at Oklahoma State University. The students in the course were not part of the population of the study. This pilot test checked for question accuracy, clarity, applicability, understanding of instructions and time to complete the entire survey. The instrument was

also passed through a panel of experts including professors involved in online courses or researching online courses. Modifications (wording, instructions, etc.) were made to the surveys based on recommendations of the pilot group. The surveys were then placed online in a Lotus Notes database.

A cover letter was developed online and preceded the online surveys. This letter explained the project, gave instructions for completing the questionnaire and gave directions on how to submit the completed survey. The cover letter was developed to be the first page or home page for the online instruments. This was done to ensure that each participant had the opportunity to read the information and understood the purpose of the study as well as the confidentiality of the study. A question was added to the end of both online survey instruments asking participants if they understood the nature of the survey and linking them back to the cover letter for reference. After the cover letter, participants were directed to the ATLAS survey pages. After completing the ATLAS survey and finding a learning strategy to best describe them, participants were linked to the faculty or student survey. The faculty and student surveys were set up so respondents had to all questions except the areas where they were given an opportunity to provide additional comments. After completing all questions on the survey, the participants were directed to click a Save & Close button. If the survey was processed, they were given a message indicating that the form had be completed and processed.

Data Analysis

All questionnaires received from each respondent were anonymous and thus stripped of all identifying factors and placed in a Lotus Notes database view so that the researcher could view the surveys. The anonymous response system was set up as a function through the Lotus Notes database and server that housed it. Responses from the questionnaires were tabulated and coded for analysis. The data was analyzed using the SPSS for MS Windows software. The statistical procedures used consisted of frequencies, means, correlation, chi-square and regression. Research question number one, "Does computer literacy differ as a function of type of student (graduate or undergraduate)?",was analyzed using regression to compare the computer literacy of graduate students versus undergraduate students. Research question number two, "Does computer confidence differ as a function of type of student (graduate or undergraduate)?", was analyzed using regression to compare the computer confidence of graduate and undergraduate students enrolled in an online course. Research question number three, "Does computer attitude differ as a function of type of student (graduate or undergraduate)?", was analyzed using regression to compare the computer attitude of graduate and undergraduate students enrolled in an online course. Research question number four, "Do learning strategies of instructors differ as a function of type of online course (graduate or undergraduate)?", was analyzed using descriptive statistics including frequencies and means to compare instructors of online graduate courses and instructors of online undergraduate courses by their learning strategies. Research question number five, "Does method of instruction differ as a function of type of online courses (graduate

or undergraduate)?", was analyzed using descriptive statistics including frequencies and means to find out the percentage of instructors in graduate and undergraduate courses using each method of instruction. Finally, research question number six, "Do learning strategies differ as a function of type of student (graduate or undergraduate)?", was analyzed using a chi-square to categorize students of online graduate and undergraduate courses by their learning strategies. Correlation was used to determine significance and relationship among the following variables: learning strategies, gender, age, classification, computer confidence, computer literacy, and computer attitude. The level of significance was established at $p \leq .05$.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

This chapter reports and discusses the results of the study. The chapter was divided into to areas. The first area describes results related to the instructor survey and the second area describes results related to the student survey. The instructor area was divided into the following sections: learning strategies of instructors, method of instruction used by online instructors, and issues related to online course development. The student area was divided into the following sections: demographic variables related to online graduate and undergraduate students, computer issues related to online graduate and undergraduate students, learning strategies of student respondents, computer literacy issues concerning students, computer confidence issues concerning students, and computer attitude issues concerning students.

Learning Strategies of Instructors

Twenty-two email messages were sent to instructors of online graduate and undergraduate courses at locations across the United States and Canada for completion of the instructor's survey and to direct students in their online courses to the student's survey. Responses were received from nine instructors for a response rate of 41%. Responses were also received from forty-five students participating in the nine courses

plus one student who was enrolled in a course that declined participation. Table 1 shows the response rate of each course.

Table 1

Student Response Rate for Participating Courses

Course	Number of Students	Number of Responses	Response Rate
Course One	36	12	33%
Course Two	12	0	0%
Course Three	15	3	20%
Course Four	47	1	2%
Course Five	71	1	1.4%
Course Six	25	4	16%
Course Seven	15	7	47%
Course Eight	22	9	41%
Course Nine	18	7	39%

Descriptive statistics were used to analyze the learning strategies of survey respondents teaching an online course. Table 2 shows the results of this analysis.

Table 2

Faculty Learning Strategies

Learning Strategy	Frequency	Percent	Valid Percent	Cumulative Percent
Engager	3	33.3	33.3	33.3
Navigator	4	44.4	44.4	77.8
Problem Solver	2	22.2	22.2	100.0
Total[a]	9	100.0	100.0	

Note. [a]N=9

Participants were divided with the majority being a Navigator (44%), while thirty-three percent were Engager. The smallest number of faculty was in the Problem Solver category (22%).

Discussion

Overall, forty-four percent of instructors were classified as Navigators meaning that schedules and deadlines were very important to them. Navigators tend to chart a course for learning and follow it. They prefer a learning process that outlines objectives and expectations, summarizes main points, gives prompt feedback, and prepares instructional situations for subsequent lessons. They are organized and focused on the learning process. (Conti & Kolody, 1998).

Thirty-three percent of instructors were Engagers meaning that they are passionate learners and must have an internal sense of the importance of learning to them personally before getting involved in learning (Conti & Kolody, 1998). Twenty-two percent of the instructors surveyed were Problem Solvers. Problem Solvers rely heavily on critical thinking and an environment of practical experimentation. They prefer to learn from examples of personal experience and problem solving activities (Conti & Kolody, 1998).

Method of Instruction Used by Online Instructors

Descriptive statistics were used to analyze the method of instruction used by instructors teaching online courses. Table 3 shows the percentage of time that instructors used each method of instruction.

Table 3

Methods of Instruction Used in Online Courses

	Range	Minimum	Maximum	Mean	Std. Deviation
Lecture	70.00	.00	70.00	22.7778	26.2335
Live Chat Sessions	25.00	.00	25.00	6.1111	10.8333
Small Groups (3-5 people)	50.00	.00	50.00	15.0000	18.3712
Individual Projects	75.00	.00	75.00	38.8889	27.1314
Large Groups (6-10 people)	25.00	.00	25.00	5.0000	10.0000
Research Papers	25.00	.00	25.00	10.0000	9.0139
Class Discussion through Email	40.00	.00	40.00	15.5556	14.2400
Class Discussion through Newsgroups	.00	.00	.00	.0000	.0000
Online Presentations	20.00	.00	20.00	5.0000	6.1237
Case Studies	40.00	.00	40.00	7.7778	12.7748
Reference to Online Sources of Information	90.00	.00	90.00	41.1111	44.2138

Note. N=9

This analysis indicated that instructors made reference to online sources of information 41.1% of the time while individual projects were used 38.9% of the time. Lecture was also indicated as one of the top methods of instruction used by faculty teaching online courses at 22.8%.

The methods of instruction least used by faculty teaching online courses were class discussion using newsgroups (0%), large group activities (5%), and online presentations (5%).

Discussion

Overall, instructors were using online resources to enrich class materials in the online environment. This finding supports claims by Reid and Woolf (1996) suggesting that in the online environment the instructor plays a more active role in facilitation of learning by guiding students to initial points of interest. This also supports Dyrli (1997) who claimed that web resources would be used to encourage collaborations that extend far beyond the traditional classroom.

One interesting point was that live chat sessions, class discussion through newsgroups, and large group activities were only used a small percentage of time in online courses indicating that the increased intimacy and exchanges among students and instructors has not yet evolved as mentioned by Bjorner (1993).

Surprisingly, lecture was still widely used as a method of instruction in the online environment. Many including Reid (1996) and Knowles (1992) seemed to predict that lectures would cease to exist and should cease to exist in the online environment, giving way to more self-directed activities. However, this study shows that lecture was still in use in the emerging online courses.

These findings may result from the fact that educators are just beginning to make the change from traditional education to distance education. They are beginning to focus instruction toward the intellectual engagement, participation, and progress of individual

students while still clinging to some aspects of the traditional classroom structure as pointed out by Kinnamen (1995).

Issues Related to the Development and Instruction of Online Courses

Descriptive statistics was used to analyze issues related to the development and instruction of online courses. Issues analyzed included past experience in teaching online courses, preparation time for an online course, the challenge of teaching an online course compared to a traditional course, the technical assistance received in developing and maintaining the online course, and the use of a homepage for the online course. Table 4 shows the results of this analysis.

Table 4

Issues Related to Teaching Online Courses

	Range	Minimum	Maximum	Mean	Standard. Deviation
Number of Online Courses Taught	13.00	2.00	15.00	3.8889	4.2262
Number of Months Teaching Online Courses	23.00	4.00	27.00	14.1111	7.2877
Number of Months Needed to Prepare the Online Course	5.00	1.00	6.00	2.4444	1.5092
Challenge	1.00	4.00	5.00	4.7778	.4410
Amount of Technical Assistance	4.00	1.00	5.00	3.4444	1.5092
Class Homepage	.00	1.00	1.00	1.0000	.0000
Class Homepage	.00	1.00	1.00	1.0000	.0000

As Table 4 indicates, instructors had taught an average of 3.9 online courses and had been teaching online courses for an average of 14.1 months or a little over one year. The average preparation time needed in developing and maintaining an online course was 2.4 months.

When asked if online courses are more challenging than traditional courses on a scale of 1, strongly disagree to 5, strongly agree, instructors had an average response of 4.8. In addition to this question, the instructors were asked to specify why they thought that the development of an online course was or was not more challenging than a traditional course. Responses to this question are presented in Table 5.

Table 5

Responses to the Challenge of Online Courses Compared to Traditional Courses

"Requires more commitment from teacher and student"
"Have to adapt curriculum with different resources"
"More preparation and presentation of materials is much more detailed"
"You are literally "on-call" 24 hours a day, 7 days a week--plus prep time is months in advance in addition to revamping that is ongoing in a course"
"Requires a rethinking of pedagogy, need to make up for all nonverbal communication available face-to-face, need to have whole course ready to go on the first day"
"The time commitment is continuous- never ending"
"Requires more commitment on the part of the instructor for preparation and requires more discipline and self motivation on the part of the student"

Next, instructors were asked how much technical assistance they had in developing and maintaining the online course on a scale of 1, all technical assistance was provided by someone else to 5, I provided all technical assistance myself, instructors had an average response of 3.4.

Finally, instructors were asked the question "Do you have a class homepage?", all instructors indicated that they did have a homepage for the online course. In addition to

this question, instructors were asked the purpose of the homepage. Table 6 displays the responses to the purpose of the class homepage.

Table 6

Uses of the Class Homepage

"General information and marketing"
"Center of all class activity"
"Introduction and announcements plus resources"
"Syllabus, Resources, Class e-mail list, Case Study posting"
"The whole course is accessed through a "course map" which is part of the SUNY Learning Network template"
"General information on the course"
"Provide information to students about courses I teach and my research interests."

Discussion

Overall, instructors had a high amount of experience in online instruction. Preparation time for online course development was an average of two and a half months. This supports literature which indicates that for an online class to add imagination and creativity that will make it worthwhile for students takes extra preparation time and planning on the part of the instructor (Hiltz, 1997). In addition, the issue of workload and extra preparation time was also stressed in the additional comments given by instructors in the study when asked why they felt online courses were more challenging than traditional courses.

Finally, in the area of technical assistance provided for instructors, instructors indicated that they did all or most of the work on the course including content development and technical support. This supports Massy (1997) who said that faculty had to specialize as developers of courses *and* courseware. Instructors are moving from

being content experts to having a combination of expertise in many areas including development of online courses and technical support for issues related to online courses.

Demographic Variables Related to Online Graduate and Undergraduate Students

Descriptive Statistics were used to analyze selected demographic characteristics of student respondents. Table 7 shows personal characteristics of the student respondents. More graduate online students (69.6%) than undergraduate online students (30.4%) responded to the survey. Approximately 43.5% of the total student participants were between the ages of 35 and 44, while 28.3% were between the ages of 21 and 34 as well as 45 and 53. Both graduate and undergraduate online students showed similar results in age categories with a large number in the 35-44 year group. However, the groups varied in other groups with undergraduates having a higher number in the 45 to 53 group (35.7%) than graduates (25%). Similarly, graduates had a higher number in the 21 to 34 group (34.4%) than the undergraduates (14.3%).

Of the total number of student respondents, sixty-three percent were female and thirty-seven percent were male. Both graduates and undergraduates showed similar results in the gender categories with a large number in the female category and a slightly smaller number in the male category. Specifically, graduate students were 65.6% female and 34.4% male while undergraduate students were 57.1% female and 42.9% male.

Table 7

Personal Characteristics of the Respondents

	Graduate[a]		Undergraduate[b]		Total[c]	
	N	%	N	%	N	%
Respondents	32	69.6	14	30.4	46	100
Age						
21-34	11	34.4	2	14.3	13	28.3
35-44	13	40.6	7	50.0	20	43.5
45-53	8	25.0	5	35.7	13	28.3
Gender						
Male	11	34.4	6	42.9	17	37.0
Female	21	65.6	8	57.1	29	63.0

Note. [a]N=32, [b]N=14, [c]N=46.

Discussion

Overall, online students both graduate and undergraduate were twenty-one years or older and almost three-fourth of the groups were over the age of thirty-five. This supports the indications in the literature review that there is a growth in the number of adults and that the nontraditional environment is mostly made up of adults (Baruch Collete-Harris Poll, 1997; Hodgkinson, 1985). One interesting finding of this study was the fact that more women than men were enrolled in the online courses for both graduate and undergraduate levels.

Computer Issues Related to Online Graduate and Undergraduate Students

Descriptive statistics were also used to analyze selected other variables related to online graduate and undergraduate students. Table 8 shows these other variables which are related to computer use and availability. The majority of student respondents indicated they owed a computer (87%) while 21.9% did not own a computer. Both graduate and undergraduate students showed similar results when asked whether they owned a computer. Slightly over 87% of graduates owned a computer while only 85.7% of undergraduates owned a computer. A slightly higher percentage of undergraduates (14.3%) than graduates (12.5%) did not own a computer. This suggests that most students own their own computer and therefore have the hardware capabilities at their fingertips to do work online. Those not owning a computer used a computer at their work (33.3%), at the school computer lab (33.3%), or used a family member's computer (33.3%).

Students were also asked how often they use a computer. Almost all of the online students indicated that they used a computer on a daily basis (93.5%) while 4.3% used a computer on a weekly basis and 2.2% used a computer on an hourly basis. When looking at the students separately on the basis of student classification, the results are similar. The majority of both graduate (93.8%) and undergraduate (92.9%) students used computers on a daily basis. The second largest group for both graduate (3.1%) and undergraduate (7.1%) used computers on a weekly basis. Finally, 3.1% of graduate students used a computer on a hourly basis.

Table 8

Computer Issues of the Respondents

	Graduate[a]		Undergraduate[b]		Total[c]	
	N	%	N	%	N	%
Own a Computer						
yes	28	87.5	12	85.7	40	87.0
no	4	12.5	2	14.3	6	13.0
If no computer, where use						
Family's Computer	1	3.1	1	7.1	2	4.3
Friend's Computer	0	0.0	0	0.0	0	0.0
School Lab	2	6.2	0	0.0	2	4.3
Kinko's	0	0.0	0	0.0	0	0.0
Other	1	3.1	1	7.1	2	4.3
How Often Use						
Never	0	0.0	0	0.0	0	0.0
Occasionally	0	0.0	0	0.0	0	0.0
Weekly	1	3.1	1	7.1	2	4.3
Daily	30	93.8	13	92.9	43	93.5
Other	1	3.1	0	0.0	1	2.2

Note. [a]N=32, [b]N=14, [c]N=46.

Discussion

These findings show that students own the hardware and resources to be successful in an online course. The few students who do not own computers still have access to computers in school labs or family homes. Since online students use computers on a daily basis, the convenience of computer access at home was a very important discovery concerning online course participants.

Learning Strategies of Student Respondents

Table 9 shows analysis of differences between the learning strategies of online graduate students and online undergraduate students using a Crosstabulation and Chi Square test. No statistically significant difference was found indicating no relationship between the learning strategies of students and student classification. As shown in Table 9, the majority of students were Navigators (41.3%) while 30.4% were Problem Solvers. Navigators chart a course for learning and follow it. Problem solvers rely heavily on all the strategies in the area of critical thinking. The smallest learning strategy group was Engagers with 28.3%. Engagers love to learn, learn with feeling, and learn best when actively engaged in a meaningful manner. The majority of graduate students were Navigators (43.8%). The majority of undergraduate students were equal among Navigators and Problems Solvers (35.7%). The next largest group for graduate students was equal among Engagers and Problem Solvers (28.1%). The smallest group for undergraduate students was Engagers (28.6%).

Table 9

Learning Strategies of the Student Respondents

	Graduate[a]		Undergraduate[b]		Total[c]	
	N	%	N	%	N	%
Engagers	9	28.1	4	28.6	13	28.3
Navigators	14	43.8	5	35.7	19	41.3
Problem Solvers	9	28.1	5	35.7	14	30.4

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.337	2	.845

Note. [a]N=32, [b]N=14, [c]N=46.

Discussion

Overall, the respondents were Navigators. This finding had no singular significance to the study but when comparing it to faculty, it becomes interesting. The majority of faculty was also Navigators. This might suggest that a majority of people participating in online courses rely heavily on planning and monitoring the learning task, on identifying resources, and on the critical use of resources. Also important to the learning environment of Navigators are schedules, deadlines, objectives/expectations of the course, summary of main points, giving prompt feedback, and a course for learning. Online course participants were almost equally divided among Engagers and Problem Solvers.

Engagers love to learn and need an internal sense of the importance of the learning before getting involved in the learning process. For Engagers, personal exploration or a focus on the learning process instead of evaluation was important.

Problem Solvers rely on critical thinking, experimentation, and problem solving activities. In combining these finding with the findings from the instructor survey, the results indicate the people involved in online courses were not as interested in practical experimentation, open-ended evaluations, or problem-solving as they were with structure and order of events.

Since there were significant numbers of students who were Engagers and Problem Solvers, the researcher would recommend a mix of techniques in online instruction to meet the needs of all learning strategies.

Correlation Between Selected Variables in Student Responses

The Bivariate Correlations procedure was used to compute Pearson's correlation coefficient with significance levels. Correlations measure how variables are related. Pearson's correlation coefficient is a measure of linear association. The association between seven variables was analyzed including student learning strategies, gender, age, classification, computer confidence, computer literacy, and computer attitude. Table 10 shows the results of this analysis. Since this analysis looks at 7 correlations, an adjustment for type 1 error was set at a 0.05 p value for a correlation to be statistically significant. Using this criterion, Table 10 indicates statistically significant correlations between the seven sets of variables.

Table 10

Correlation of Selected Variables Related to Student Responses

	Learning Strategies	Gender	Age	Classification	Computer Confidence	Computer Attitude
Gender	.526					
Age	.179	.527				
Classification	.777	.593	.402			
Computer Confidence	.918	.107	.710	.367		
Computer Attitude	.858	.009**	.808	.532	.000**	
Computer Literacy	.644	.018*	.159	.857	.000**	.000**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2 tailed).

A statistically significant relationship was found between gender and computer literacy (.018), gender and computer attitude (.009), computer attitude and computer confidence (.000), computer literacy and computer confidence (.000), and computer literacy and computer attitude (.000).

Figure 1 shows the relationship between computer literacy and gender. These findings seem to indicate that women were less comfortable with their ability to use a computer than men.

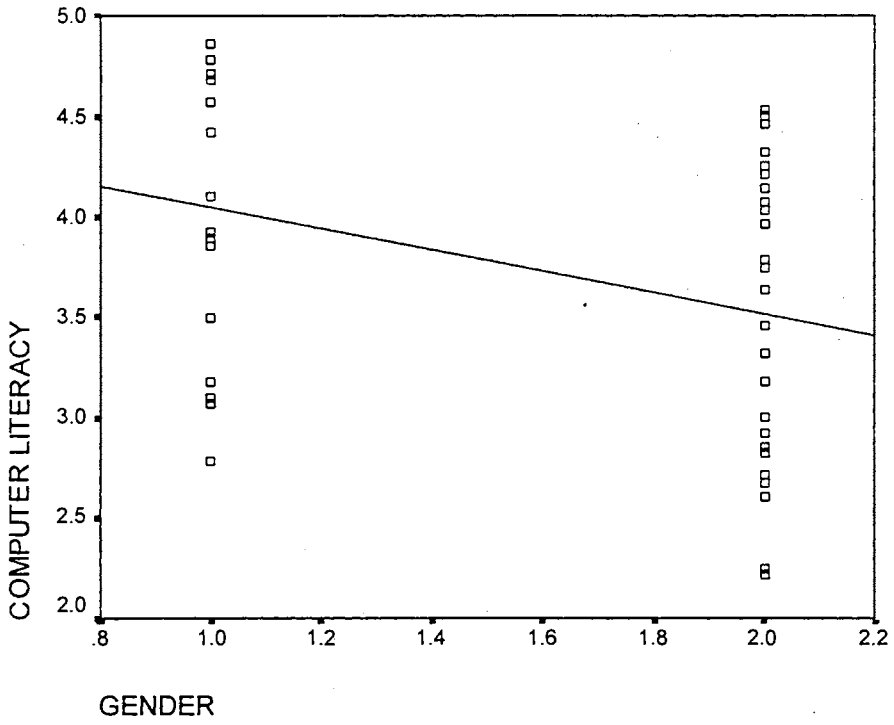

Figure 1. Gender as a Predictor of Computer Literacy

Figure 2 shows the comparison of computer attitude and gender. As you can see from this diagram, men had a better attitude toward computers than women. Regarding the relationship between computer attitude, computer confidence, and computer literacy, the significance in these areas indicated to the researcher that the survey variables were significantly related and testing the same concept. This finding was supported by the high alpha on all items included in the three variables.

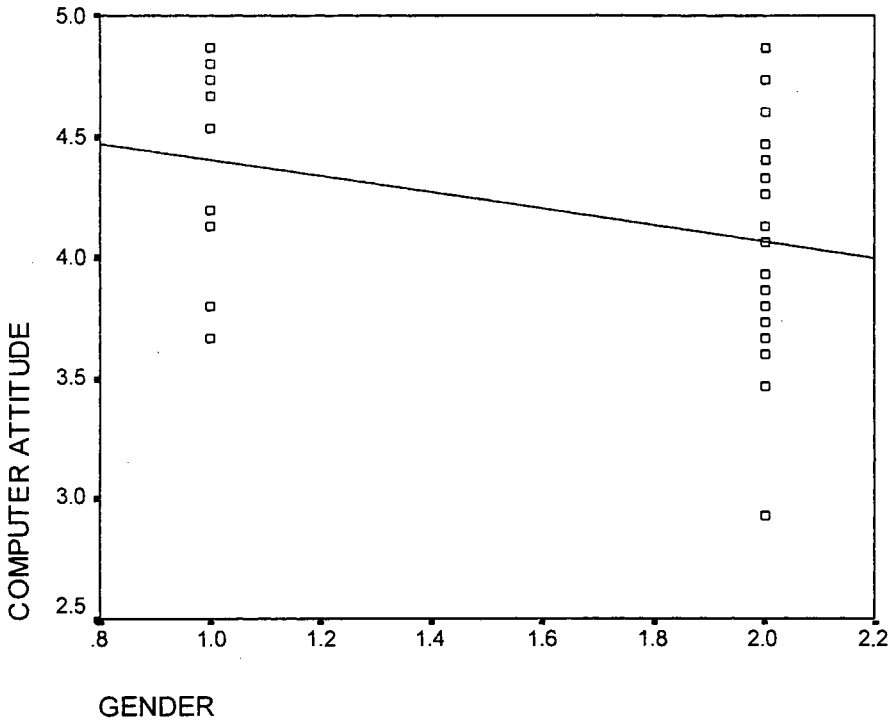

Figure 2. Gender as a Predictor of Computer Attitude

Computer Literacy Issues Concerning Student Respondents

In this study, Simple Linear Regression analysis using changes in computer literacy as the criterion variable and student classification (graduate and undergraduate) as predictor variables indicates no statistically significant relationship (.857) between student classification and computer literacy (See Figure 3).

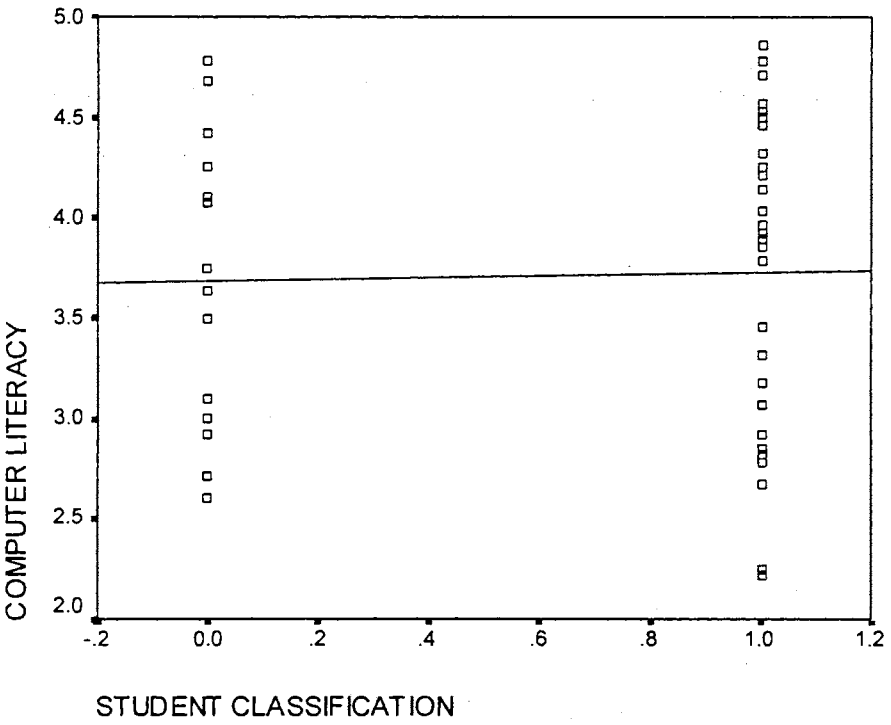

Figure 3. Student Classification as a Predictor of Computer Literacy

Discussion

As indicated, the results show that computer literacy was equal when comparing graduate to undergraduate students. This may be due to the fact that most students own a computer and most use computers on a daily basis, therefore, increasing their knowledge of the computer. Also, like previous perceptions (Brown & Kester), equality of computer literacy among adults and young adults may come from the increased use of software for tasks that go beyond basic word processing. This finding supports Larson & Smith (1994) who indicated that the number of computer illiterate student was decreasing with each year.

Computer Confidence Issues Concerning Student Respondents

Simple Linear Regression analysis using changes in student classification (graduate and undergraduate) as the criterion variable and changes in the computer confidence variable as predictor variable, indicated no statistically significant relationship (.367) (See Figure 4).

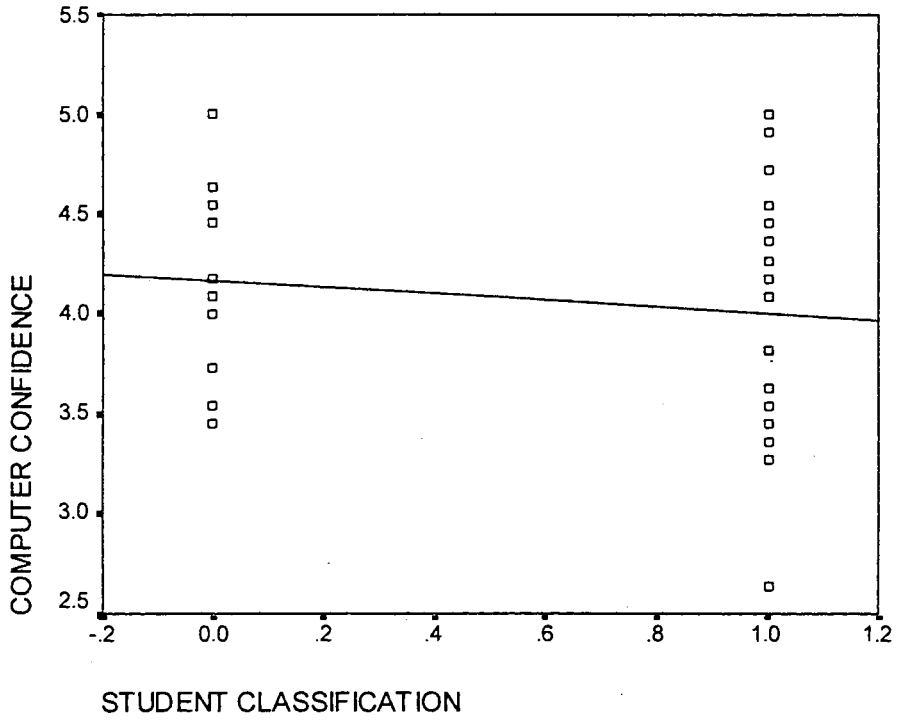

Figure 4. Student Classification as a Predictor of Computer Confidence

Discussion

Computer confidence as with computer literacy was also equal among graduate and undergraduate students. Again, this may be due to the fact that students own, use and have access to computers on a daily basis.

Computer Attitude Issues Concerning Student Respondents

Simple Linear Regression analysis using changes in student classification (graduate and undergraduate) as the criterion variables and residualized changes in the computer attitude variable as predictor variable, indicated no statistically significant relationship (.532) (see Figure 5).

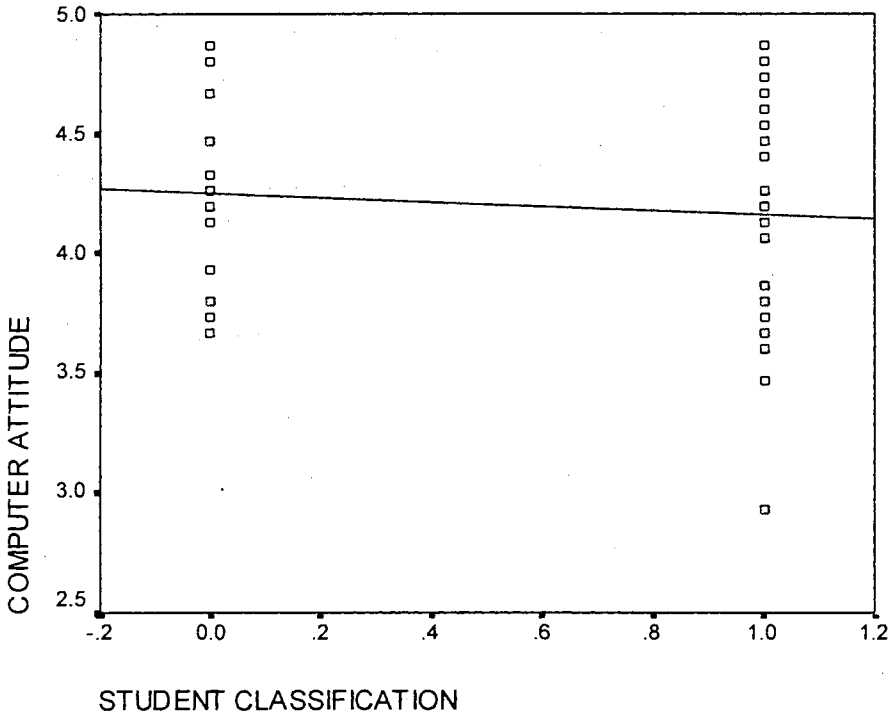

Figure 5. Student Classification as a Predictor of Computer Attitude

Discussion

These findings indicate no difference in computer attitude among undergraduate students and graduate students. This could be from the extended experience of students using computers beyond high school. As Larson and Smith (1994) indicated, most of the students they studied cited high school as their ultimate source of computer knowledge.

Now with the increased source and use of computer knowledge beyond high school, students may see computers as an advantage not a requirement for high school graduation.

Mean Comparisons Between Graduate and Undergraduates for Computer Variables

Although no significance was shown using Regression analysis in the previous sections, the researcher used mean comparisons to rank the survey items in relation to responses by both graduates and undergraduates.

Mean Comparisons Related to Computer Attitude

In a comparison of student classification and computer attitude, the researcher found that the items respondents (both graduate and undergraduate) agreed to most was tied between question 7, "I don't have any use for the computer on a day-to-day basis" and question 10, "I do not think computer technologies will be useful to me beyond this course." These items were reverse coded so keep in mind that these items indicate that students strongly agree that they use computers on a daily basis and find computer technology useful beyond the online course. The second item that respondents agreed to most was tied between question 29, "I don't see how computer technologies can help me learn new skills" and question 31, "Knowing how to use computer technologies will not be helpful to me in the future." Both of these items were reverse coded for analysis

indicating that students feel computer technologies can help them learn new skills and knowing how to use computers will be helpful.

The smallest overall mean was for question 45, "I feel I need more interaction with the teacher and other students to be successful in an online course." The second smallest overall mean was for question 47, "I feel as comfortable in an online setting as I do in a traditional classroom setting." (See Table 11)

Table 11

Comparison of Student Classification and Computer Attitude Means

	Undergraduate		Graduate		Total	
	N	Mean	N	Mean	N	Mean
**ca1	14	*4.7143	32	4.0963	46	4.8478
ca3	14	4.7143	32	4.9063	46	4.8478
ca8	14	4.6429	32	4.6562	46	4.6522
ca9	14	4.5000	32	4.7188	46	4.6522
ca15	14	4.5714	32	4.3438	46	4.4130
ca4	14	4.4286	32	4.3750	46	4.3913
ca5	14	4.3571	32	4.3438	46	4.3478
ca10	14	4.5714	32	4.2500	46	4.3478
ca6	14	4.4286	32	4.2500	46	4.3043
ca2	14	4.1429	32	4.0938	46	4.1087
ca7	14	4.3571	32	3.9062	46	4.0435
ca14	14	4.2857	32	3.7500	46	3.9130
ca12	14	3.7857	32	3.9375	46	3.8913
ca13	14	3.6429	32	2.9687	46	3.1739
ca11	14	2.6429	32	3.0625	46	2.9348

Note. *Scale: 1=Strongly Disagree 5=Strongly Agree

**See Table 14, Appendix C for coding translations.

Discussion

The most interesting findings in this area were that students do not feel they need more interaction with the instructor or other students in the online course. Also, students feel as comfortable in the online environment as in a traditional setting. This supports

Bjorner (1993) who claimed that the online environment has an advantage over traditional environments because of the increased intimacy among students and among students and instructors.

Mean Comparisons Related to Computer Confidence

In a comparison of student classification and computer confidence, the researcher found that the most important item by respondents (both graduate and undergraduate) question 26, "I am anxious about computers because I am afraid I will mess something up or break something." This item was reverse coded so respondents strongly agreed that they were not afraid or anxious about computers. The second most important item was question 15, "Whether or not I succeed in an online course is up to me."

The smallest mean was for question 12, "The instructor helps me feel confident in the course." The second smallest mean was tied between question 11, "I feel at ease learning with computer technologies" and question 59, "I feel confident I will have the support necessary to overcome any problems in this online course." (See Table 12)

Table 12

Comparison of Student Classification and Computer Confidence Means

	Undergraduate		Graduate		Total	
	N	Mean	N	Mean	N	Mean
**cc6	14	*4.3571	32	4.3750	46	4.3696
cc4	14	4.5714	32	4.2500	46	4.3478
cc7	14	4.3571	32	4.2188	46	4.2609
cc1	14	4.0000	32	4.3438	46	4.2391
cc11	14	4.2857	32	3.9687	46	4.0652
cc5	14	4.3571	32	3.9062	46	4.0435
cc9	14	4.1429	32	3.8750	46	3.9565
cc8	14	4.0714	32	3.8750	46	3.9348
cc2	14	3.9286	32	3.8750	46	3.8913
cc10	14	3.9286	32	3.8750	46	3.8913
cc3	14	3.8571	32	3.4687	46	3.5870

Note. *Scale: 1=Strongly Disagree 5=Strongly Agree
**See Table 15, Appendix C for coding translations.

Discussion

These findings indicate that students took responsibility in their own success in the online course, however, they indicated that they did not feel supported in the online environment by the instructor. This supports Partridge (1993) who suggested that the computer can support instruction, but high quality teaching must still be provided. These findings also support Hiltz (1997) who said that faculty must receive training and support to make an online course worthwhile for students. If students do not feel supported in the environment, they may not do as well.

Mean Comparisons Related to Computer Literacy

In a comparison of student classification and computer literacy, the researcher found that the item respondents (both graduate and undergraduate) agreed to most was question 24, "I could use technologies to access many types of information sources on the Internet." The second highest overall mean score was for question 35, "I am confident responding to email messages." The smallest overall mean found was for question 56, "I communicate through Newsgroups on a regular basis." The second smallest overall mean was for question 57, "I am comfortable using Authorware packages (Ex. Macromedia, Authorware, Toolbook, etc.)."(See Table 13)

Table 13

Comparison of Student Classification and Computer Literacy Means

	Undergraduate		Graduate		Total	
	N	Mean	N	Mean	N	Mean
**cl7	14	*4.7143	32	4.4688	46	4.5435
cl13	14	4.5714	32	4.5000	46	4.5217
cl1	14	4.1429	32	4.6250	46	4.4783
cl10	14	4.2143	32	4.5938	46	4.4783
cl17	14	4.2857	32	4.3438	46	4.3261
cl9	14	4.3571	32	4.1875	46	4.2391
cl4	14	3.8571	32	4.2188	46	4.1087
cl8	14	4.2143	32	4.0313	46	4.0870
cl15	14	3.9286	32	4.1563	46	4.0870
cl24	14	3.9286	32	4.0625	46	4.0217
cl21	14	4.2143	32	3.9063	46	4.0000
cl2	14	3.8571	32	3.9063	46	3.8913
cl25	14	4.0000	32	3.8437	46	3.8913
cl14	14	4.0000	32	3.8125	46	3.8696
cl12	14	3.9286	32	3.6562	46	3.7391
cl23	14	3.5714	32	3.8125	46	3.7391
cl5	14	3.0714	32	3.7813	46	3.5652
cl28	14	3.4286	32	3.5625	46	3.5217
cl3	14	3.2857	32	3.5313	46	3.4565
cl19	14	3.5000	32	3.4375	46	3.4565
cl11	14	3.0714	32	3.5312	46	3.3913
cl6	14	2.9286	32	3.3438	46	3.2174
cl16	14	3.2143	32	3.2188	46	3.2174
cl18	14	3.4286	32	3.1250	46	3.2174
cl22	14	3.4286	32	3.0938	46	3.1957
cl20	14	3.0000	32	3.1250	46	3.0870
cl27	14	2.5000	32	2.3125	46	2.3696
cl26	14	2.5000	32	2.1875	46	2.2826

Note. *Scale: 1=Strongly Disagree 5=Strongly Agree

**See Table 16, Appendix C for coding translations.

Discussion

Overall, these findings indicate that students felt most comfortable finding information on the Internet and responding to email messages. The respondents felt least confident communicating through Newsgroups regularly and using Authorware

packages. This could be due to the fact that the chief computer experience cited by students was Word Processing with little to no knowledge in desktop publishing, presentation, spreadsheet, and other types of software as reported by Larson & Smith (1994).

CHAPTER V

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Summary

With the increase in the number of online courses, commitment to technology by educators, and number of adults participating in online courses, a study of the differences between graduate and undergraduate online course participants as well as instructors teaching online courses was important. The purpose of this research was to examine differences between undergraduate and graduate students in online courses and describe the learning strategies and methods of instruction used by instructors of online courses. Six research questions were formed and the results of the data collected from 9 undergraduate and graduate online courses selected from a nationwide list of online courses were presented in Chapter IV.

Research question number one, "Does computer literacy differ as a function of type of student (graduate or undergraduate)?, was analyzed using Regression. The results showed no statistically significant difference between graduate and undergraduate students regarding computer literacy. Most students owned their own computer and used computers on a daily basis. The few who didn't own computers had access to the technology in computer labs or family homes. Results showed that men felt more computer literate than women. One of the lowest computer literacy means was in using Authorware type applications.

Research question number two, "Does computer confidence differ as a function of type of student (graduate or undergraduate)?", was analyzed using Regression. The

results showed no statistically significant difference between graduate and undergraduates regarding computer confidence. The results indicated that students felt that success in an online course was up to them. Slightly more men than women felt confident in their use of computers with some women indicating that they had a fear of messing something up while using the technology. Students indicated that they did not feel they had adequate support and help from instructors.

Research question number three, "Does computer attitude differ as a function of type of student (graduate or undergraduate)?", was analyzed using Regression. The results indicated no statistically significant difference between graduate and undergraduate students regarding computer attitude. All students felt that computer technologies were important and useful to them. Men had a slightly better attitude toward using computers than women. Students did not feel that they needed more interactions with other participants to be successful or enjoy the course.

Research question number four, "Do learning strategies of instructors differ as a function of type of online course (graduate or undergraduate)?", was analyzed using Descriptive statistics including frequencies and means. The results indicated undergraduate instructors were equally represented in the Engager and Navigator learning strategies with one instructor in each group. Graduate instructors were almost equal among Engagers (two instructors), Navigators (3 instructors), and Problem solvers (two instructors). The majority of both undergraduate and graduate instructors were Navigators.

Research question number five, "Does method of instruction differ as a function of type of online course (graduate or undergraduate)?", was analyzed using Descriptive

statistics including frequency and means. The percentage of instructors in graduate and undergraduate courses using each method of instruction were analyzed. The results indicated that reference to online resources was used the most (41%) in both groups. Individual projects were also used significantly in both graduate and undergraduate online courses with equal representation in both groups. Finally, lecture was used twenty-two percent of the time in both groups with more graduate courses than undergraduate courses using this method of instruction. The methods least used by both groups were large group projects, online presentations, and class discussion through newsgroups. Chat, discussion, and group activities were used a small percentage of the time while lecture was still being used significantly indicating that instructors are still holding on to traditional methods of instruction.

Research question number six, "Do learning strategies differ as a function of type of student (graduate or undergraduate)?", was analyzed using Chi-Square. Students in both graduate and undergraduate online courses were categorized into their learning strategies. The majority of both groups were Navigators (44%). Graduates had equal representation in the Engager and Problem Solver strategies while more undergraduate were Problem Solvers than Engagers.

Correlation was also used in the study to determine if there was a significant relationship between the following variables: learning strategies, gender, age, classification, computer confidence, computer literacy, and computer attitude. A significant relationship was found between gender and computer literacy, gender and computer attitude, computer attitude and computer confidence, computer literacy and computer confidence, and computer literacy and computer attitude. These findings

indicated that women were slightly less comfortable using computer than men. However, the variables may be testing the same thing so this finding is really inconclusive until further research has been done using the survey.

Instructors of Online Courses

Overall, instructors of online courses were Navigators. This learning strategy category indicates that schedules and deadlines are important to them in the learning process. They tend to plan for learning and follow the plan very carefully. However, the results of the study indicate that even though the majority of instructors were Navigators a representative number of them were also Engagers and Problem Solvers so a variety of strategies will appear in their teaching.

These instructors use online sources of information and individual projects the most in their online courses. Most of the respondents had been teaching online an average of 14.1 months and had taught an average of 3.9 online courses. They spent an average of 2.4 months preparing the online courses and felt that online courses were more challenging than traditional courses because of the extra preparation time and commitment to the course.

Online instructors indicated that they provide most of the technical assistance with some help from another person. All of the online instructors indicated that they have a homepage for the online course. The homepage is used for providing general information, class announcements, and an introduction to the course.

Students Participating in Online Courses

The majority of student respondents was age 35-44, female, owed their own computer, and used a computer on a daily basis. The majority of online student respondents were Navigators. This learning strategy category indicates that they like to know what is expected of them. They rely heavily on schedules, planning, and monitoring of the learning task outlined in the course. However, as with the instructors, a representative number of students were also in the Problem Solver and Engager learning strategies indicating that a variety of methods need to be used to meet the needs of learners in online courses. In addition, male student respondents indicated that they felt more computer literate and had a better computer attitude than female respondents.

Student classification made no difference when comparing undergraduate and graduate students' computer literacy, computer confidence, or computer attitude. Students felt strong about their abilities to succeed and use computer technologies in an online environment but lacked confidence in support from instructors, communication through Newsgroups, and the use of Authorware applications.

Implications

This study suggests that instructors have more experience in developing online courses than shown in previous research. This could be due to the increase in the demand and development of online courses nationwide. However, the demand has increased with no additional support by schools. As shown in this study, instructors lack the technical

assistance needed to maintain the courses and respondents can feel this lack of support. Instructors indicated that they were responsible for all or most of the technical support for the course. Additional support from educational institutions could help free instructors to improve the curriculum and methods of instruction used in online courses or decrease the preparation time needed to create a successful online course. As this study suggests, instructors are still widely using techniques previously associated with a traditional classroom such as lecture. They have not completely merged into the new environment by using collaborative techniques such as discussions and group activities although these techniques can be very useful in an online environment depending on the audience and type of situtation. Instructors should be given time to explore new techniques for the online environment instead of being imprisoned by the technical issues related to online courses.

Educational institutions should look at providing online courses targeted at adult students with a variety of learning strategies for several reasons. First, respondents of both undergraduate and graduate courses were above the age of 21 with the majority being over 35. As indicated by previous research, the number of adults in online courses is increasing and this study supports that conclusion. Second, the majority of respondents both instructors and students were Navigators but there were still a significant number who were both Problem Solvers and Engagers. For this reason, courses will have to be designed in an organized manner with the content focused toward a variety of learning tasks.

This paper sets a foundation for future research in the area of online courses. Since the research was exploratory, there are several avenues open for future researchers

to take that would improve and build upon the knowledge base of educational institutions concerning online courses.

Recommendations

The student research questionnaire consisted of a wide variety of questions related to computer literacy, computer confidence, and computer attitudes. As mentioned in Chapter IV, some findings of this study led the researcher to believe that the student survey instrument used to analyze computer literacy, computer confidence, and computer attitude would be more reliable if analyzed as one variable instead of three different variables. These indications came from the negative correlation associated with some of the variables when analyzed using Pearson's Correlation and the lack of significance found within the separate variables when compared with student classification. It is also recommended that a Factor Analysis be used to identify any underlying variables in the survey.

Another recommendation was that the computer attitude, computer confidence, and computer literacy variables be used to analyze instructors as well as students. Literature shows that, particularly, computer literacy was also important to the success of instructors in online courses.

For future research, an instrument should be designed taking these considerations into account and test a new population of online courses. This study was exploratory and limited to the nine courses surveyed. Future research should broaden the scope and examine online courses in different regions of the United States, different types of

institutions (corporate and educational), online courses given through a specific application (LearningSpace, Blackboard, etc.), online courses given in different areas (continuing education, community education, corporate training, etc.), or online courses concentrating on topics beyond education (science, medicine, engineering, speech, foreign language, etc.). This study surveyed both graduate and undergraduate students. Future research could look at just the graduates or just the undergraduates and make the construction of the questionnaire focused toward one or the other. Future research could also separate male and female since results of this study indicated some differences between the two genders.

Future research should look at the method of distribution. The researcher had many problems associated with distributing the surveys online. First, the instructor had to direct the students to the online survey which many did not want to take the time to do. Second, survey responses were not received by the researcher if the server was busy or down for maintenance. However, this can be a problem with any online environment. Third, the online survey required respondents to click a submit button at the bottom of the screen. If respondents did not click the button, the survey results were not sent. A better method could be designed that would yield a higher number of respondents. Email seems to be more reliable than online forms and could be used for future research to see if the number of responses is increased. In this study, the researcher ended up using email to get lost responses from participants whose surveys were destroyed in the transmission process.

Conclusion

This study determined that the majority of online course participants were adults who require a course focused toward a variety of learning strategies. Students in online courses have the ability (both hardware and knowledge) to succeed in the online environment if instructors are given the technical assistance and preparation time to make the course interesting and task-driven. Some differences exist between males and females concerning computer literacy indicating that females may need more online assistance than males. Also, differences exist between males and females concerning their attitude toward computers. This may change when females become more confident in the use of computers or have the opportunity to use computers more there by increasing their literacy level. However, no significant differences existed between graduates and undergraduates regarding computer literacy, computer confidence, or computer attitudes.

The topic of online courses and the online environment will continue to grow and with this growth will be the necessity for future research in the area. The findings of the study are limited to the subjects analyzed and should not be generalized beyond this population. This study is just the beginning of a long line of research focused toward the online environment. This study should be built on by other researchers and used to add to the body of knowledge of educational institutions worldwide.

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APPENDIX A

COVER LETTERS FOR BOTH INSTRUCTOR AND STUDENT SURVEY INSTRUMENTS

Dear Instructor:

I would appreciate your opinion on the following questionnaire that requests information concerning strategies and methods of instruction used by instructors of online courses. The survey is part of a study being conducted through Oklahoma State University. I believe your input is important for the future of online courses.

The questionnaire has two sections. The first section takes you through several questions and asks you to decide on a specific answer for each leading to a description of your learning strategy. Learning strategies are the strategies you use to be successful in a learning environment. The second section requests information about the various methods of instruction you use in your online course(s). When you have completed the questionnaire, please submit it anonymously by pressing the "Save & Close" button. The questionnaire will have all identifying factors such as your return email address, etc. removed upon submission to the researcher to ensure your confidentiality. The information you provide on the survey will be reported in summary form only. I have taken every precaution to ensure that all information you provide on the questionnaire is confidential. No attempt will be made to identify any individual with their completed questionnaire.

The information gathered from the survey will be used to produce a report concerning issues related to online courses. If you would like a copy of this report, please email me. In your email, please specify your request for the information, name, and address. If you would like a copy of the student report produced from the survey they fill out, please indicate your request for the student report in the same email in which you request a copy of the instructor's report. Requesting the final results by email will ensure that your name and address are kept separate from the information on the questionnaire.

Again, your opinion is very important. I anticipate that the questionnaire will take no more than 10 minutes to complete. Most participants have found it easier to complete the form online and return it immediately.

Thank you very much for your time and cooperation thus far in the project. If you have any questions, please call Machelle Davison at (405)744-6757 or email me at davisam@okstate.edu .

Sincerely,

Machelle Davison
Doctoral Candidate
Oklahoma State University
422 Classroom Building
Stillwater, OK 74078

Dear Participants:

I would appreciate your opinion on the following questionnaire that requests information concerning differences among students taking online courses. The questionnaire will focus on differences in students' learning strategies, computer confidence, and computer literacy. The questionnaire is part of a study being conducted through Oklahoma State University. I believe your input is important for the future of online courses and for the ability of online courses to meet the needs and differences among students.

The questionnaire has three sections. The first section takes you through several questions and asks you to decide on a specific answer for each leading to a description of your learning strategy. Learning strategies are the strategies you use to be successful in a learning environment. The second section asks for demographic information. The final section requests information about your perception of your own computer confidence and literacy levels. When you have completed the questionnaire, please submit it anonymously by pressing the "Save & Close" button. The questionnaire will have all identifying factors such as your return email address, etc. removed upon submission to the researcher to ensure your confidentiality. The information you provide on the survey will be reported in summary form only. I have taken every precaution to ensure that all information you provide on the questionnaire is confidential. No attempt will be made to identify any individual with their completed questionnaire.

The information gathered from the survey will be used to produce a report concerning issues related to online courses. If you would like a copy of this report, please email me. In your email, please specify your request for the information, name, and address. Requesting the final results by email will ensure that your name and address are kept separate from the information on the questionnaire.

Again, your opinion is very important. I anticipate that the questionnaire will take no more than 20 minutes to complete. Most participants have found it easier to complete the form online and return it immediately.

Thank you very much for your time and cooperation thus far with this project. If you have any questions, please call Machelle Davison at (405)744-6757 or email me at davisam@okstate.edu

Sincerely,

Machelle Davison
Doctoral Student
Oklahoma State University
422 Classroom Building
Stillwater, OK 74078

APPENDIX B

SURVEY INSTRUMENTS FOR BOTH INSTRUCTORS AND STUDENTS

Welcome to the ATLAS Online Survey!!

(*A*ssessing *T*he *L*earning Strategies of *A*dult*S*)

Find out what your learning strategies are. ATLAS is an instrument which allows you to quickly access the pattern of the learning strategies which you use. Click Start Atlas to begin the survey. Click Learning Strategies Defined or Validity of the Atlas to learn more about the survey itself.

Start ATLAS	Learning Strategies Defined	Validity of ATLAS

Online Survey Homepage

(*A*ssessing *T*he *L*earning Strategies of *A*dult*S*)

Directions: The following pages have questions on them related to learning in real-life situations in which you control the learning situation. ***These are situations that are not in a formal school.*** For each one, select the answer that best fits you. Continue this process until you learn your ***group name*** and the description of your group. Then click the ride on button on the group description page to continue the online survey.

START

Atlas Homepage

Online Survey Homepage

Start

When considering a new learning activity such as learning a new craft, hobby, or skill for use in my personal life.

Path 1
I like to identify the best possible resources such as manuals, books, modem information sources, or experts for the learning project.

Path 2
I'm not interested in the learning activity until I am convinced that I will enjoy it enough to finish it.

Path 1

It is important for me to:

Path 1a
Focus on what needs to be learned and then set up a plan for learning it.

Path 1b
Think of a variety of ways of learning the material.

Path 2

You are an Engager.

Path 2a
Proceed to the next page to answer one or more questions confirm your correct placement in this groups.

Path 1a

I like to:

Path 1aa
Involve other people who know about the topic I am learning.

Path 1ab
Structure the information to be learned to help remind me that I can successfully complete the learning activity.

Path 1b

You are a Problem Solver.

Path 1ba
Proceed to the next page to answer one or more questions to confirm your correct placement in this group.

Path 2a

Now that you have your group name, please answer one more question to confirm that ATLAS has placed you in the proper group.

When starting a new learning activity such as learning a new craft, hobby, or skill for use in my personal life, it is important for me to:

Path 3
Focus on the material to be learned by doing such things as setting aside time for learning or avoiding distractions.

Path 4
Identify a variety of ways of learning the material or of solving the problem related to the material.

Path 5
Feel confident that I can complete the learning task.

Path 1aa

You are a Navigator.
There are two subgroups within the Navigators. You are in Subgroup 1.

Path 2a
Proceed to the next page to answer one more question to confirm your correct placement in this group.

Path 1ab

You are a Navigator. There are two subgroups within the Navigators. You are in Subgroup 2.

Path 2a
Proceed to the next page to answer one more question to confirm your correct placement in this group.

Path 3

You should be a Navigator. Is this correct?

Navigator
Yes

Start Over
No

Path 4

You should be a Problem Solver. Is this correct?

Problem Solver
Yes

Start Over
No

Path 5

You should be a Engager. Is this correct?

Engager Yes

Start Over No

Navigator

Description: Focused learners who chart a course for learning and follow it. Subgroup 1 likes to use human resources while Subgroup 2 is more concerned with the organization of the material into meaningful patterns.

Characteristics: Focus on the learning process that is external to them by relying heavily on planning and monitoring the learning task, on identifying resources, and on the critical use of resources.

Instructor: Schedules and deadlines helpful. Outlining objectives and expectations, summarizing main points, giving prompt feedback, and preparing instructional situation for subsequent lessons.

The two other types of learning groups are:

Problem Solvers
Engagers

Problem Solver

Description: Learners who rely heavily on all the strategies in the area of critical thinking which includes Testing Assumptions, Generating Alternatives, and Conditional Acceptance.

Characteristics: Test assumptions, generate alternatives, practice conditional acceptance, as well as adjusting their learning process, use many external aids, and identify many of resources. Like to use human resources and usually do not do well on multiple-choice tests.

Instructor: Provide an environment of practical experimentation, give examples from personal experience, assess learning with open-ended questions and problem- solving activities.

The two other types of learning groups are:

Navigators
Engagers

Engagers

Description: Passionate learners who love to learn, learn with feeling, and learn best when actively engaged in a meaningful manner.

Characteristics: Must have an internal sense of the importance of the learning to them personally before getting involved in the learning. Once confident of the value of the learning, likes to maintain a focus on the material to be learned. Operates out of the Affective Domain related to learning.

Instructor: Provide an atmosphere that creates a relationship between the learner, the task, and the teacher. Focus on learning rather than evaluation and encourage personal exploration for learning. Group work also helps to create a positive environment.

The two other types of learning groups are:

Navigators
Problem Solvers

Start Over

Sorry! You did not respond to the last item the same way that you did to the previous ones. You may either Start Over or go to the description of the group listed below in which your first answers placed you. However, be aware that this group placement may be inaccurate.

Navigator
Navigator

Problem Solver
Problem Solver

Engager
Engager

[redacted]

A Survey of Instructors Teaching Online Courses

Click here to review the cover letter again.

After completing the Atlas survey, what group name best described your learning strategies.

Please indicate the percentage of time that you use the following instructional methods in your online course. Please answer questions in the answer field provided by highlighting the text in the field with your mouse, hitting delete on the keyboard, and typing your answer in the blank space that remains.

Lecture	-type in a percentage-
Live Chat Sessions (real time discussion)	-type in a percentage-
Small Group Activities (3-5 people)	-type in a percentage-
Individual Projects	-type in a percentage-
Large Group Activities (6-10 people)	-type in a percentage-
Research Papers	-type in a percentage-
Class Discussion Through Email	-type in a percentage-
Class Discussion Through Newsgroups	-type in a percentage-
Online Presentations	-type in a percentage-
Case Study	-type in a percentage-
Reference to Online Sources of Information	-type in a percentage-
Other	Please specify,

Answer the following questions using the answer field provided for each question. Make selections in a drop down menu by clicking the arrow next to the answer field and clicking on the selection you want with your mouse. Your selection will appear in the answer space. To answer questions in a text box, highlight the text in the answer field with your mouse, hit delete on the keyboard, and type your answer in the blank space that remains.

Optional Please indicate the title and number for the online course which you currently teach.	Title: -type in a title- Number:-type in a course number-
How many online courses have you taught?	Please indicate the number of courses.type in the number of courses

How long have you been teaching online courses?	Please indicate in months. type the number of months here
How long was the preparation time for this online course?	Please indicate in months. type the number of months here
Online courses are more challenging than traditional classroom courses.	-click arrow- Please specify, why
Did you have any technical assistance in developing this online course?	-click arrow- Other Comments
Do you have a class homepage?	○ yes ○ no If yes, what is its main purpose or function
Briefly give any additional comments about the online course (creation, methods of instruction, difficulties).	

Do you understand that information provided in this questionnaire will be reported in summary form only and that no attempt will be made to indentify you with your completed questionnaire thus ensuring your confidentiality?

● yes ○ no

Click here to review the cover letter again.

Important: When you have completed all questions on the survey, click the Save and Close button below to process the form.

Save &

Thanks Very Much for Your Participation!!!

For more information regarding this study/instrument or to receive a copy of the final report, please email Machelle Davison at davisam@okstate.edu

A Survey of Participants in Online Courses

Click here to review the cover letter again.

After completing the Atlas survey, what group name best described your learning strategies.

Answer the following questions using the answer field provided for each question. Make selections from a drop down menu by clicking the arrow next to the answer field and clicking on the selection you want. The answer you selected will be displayed in the answer space. For questions that require you to type in information, simply highlight the text in the answer space with your mouse, hit delete on the keyboard, and type in your answer.

1. Please indicate the title and number for the online course in which you are currently enrolled.	Title (i.e., Introduction to Education): Number (i.e., EDUC 1001):
2. Please identify your gender group.	-click arrow-
3. Please specify your age.	Type your age in years here.
4. What is your student classification?	-click arrow- Other, please specify -type text here-
5. Do you own a computer?	○ yes ○ no If no, where do you go to use a computer-click arrow- Other, please specify -type text here-
6. How often do you USE a computer and computer technologies?	-click arrow- Other, please specify -type text here-

For the remaining questions, please indicate the degree to which you agree or disagree with the statements. You will make selections by clicking the arrow next to the answer field and click on the selection you want. The answer you select will be displayed in the answer space.

7. I don't have any use for the computer on a day-to-day basis.	-click arrow-
8. I am confident about my ability to do well in a course that requires me to use computer technologies.	-click arrow-
9. Using computer technologies, will only mean more work for me.	-click arrow-
10. I do not think computer technologies will be useful to me beyond this course.	-click arrow-
11. I feel at ease learning with computer technologies.	-click arrow-

12. The instructor helps me feel confident in the course.	-click arrow-
13. I am not the type of person who does well with computer technologies.	-click arrow-
14. Anything that computer technology is used for---I can do better some other way.	-click arrow-
15. Whether or not I succeed in an online course is up to me.	-click arrow-
16. Requirements for success in this online course have been made clear to me.	-click arrow-
17. I am confident I can do any assignment involving word processing skills (Ex. Microsoft Word, WordPerfect, etc.)	-click arrow-
18. I understand how a computer functions.	-click arrow-
19. The thought of using computer technologies frightens me.	-click arrow-
20. I am confident I can do any assignment involving spreadsheet software (Ex. Microsoft Excel, Lotus 1-2-3, CorelSuite, etc.)	-click arrow-
21. Computer technologies are confusing to me.	-click arrow-
22. I have never worked with spreadsheet software.	-click arrow-
23. I understand and can accomplish any task required using spreadsheet software.	-click arrow-
24. I could use technologies to access many types of information sources on the Internet.	-click arrow-
25. I do not feel threatened by the impact of technologies on society.	-click arrow-
26. I am anxious about computers because I am afraid I will mess something up or break something.	-click arrow-
27. I understand how to use computers in my school library for literature searches.	-click arrow-
28. I am confident I can do any assignment involving Internet searching.	-click arrow-
29. I don't see how computer technologies can help me learn new skills.	-click arrow-
30. I feel comfortable about my ability to work with computer technologies.	-click arrow-
31. Knowing how to use computer technologies will not be helpful to me in the future.	-click arrow-
32. I am confident using email for communication.	-click arrow-
33. I can do any tasks assigned in a presentation type software (Ex. PowerPoint, CorelSuite, Lotus Freelance)	-click arrow-
34. I get frustrated trying to search for information on the Internet.	-click arrow-
35. I am confident responding to email messages.	-click arrow-
36. I am confident using databases (Ex. ERIC, PsyLit, etc.) to search for information via the Internet.	-click arrow-

37. I am confident attaching files to an email message.	-click arrow-
38. I know how to use computers to manage data in database software (Ex. Microsoft Access, Lotus Approach, etc.)	-click arrow-
39. I am confident sending the same email message to more than one person.	-click arrow-
40. I am confident using Newsgroups to communicate with others.	-click arrow-
41. I am confident that I can develop a homepage on my own.	-click arrow-
42. I feel comfortable that all the resources I need to successfully complete an online course are available to me.	-click arrow-
43. I understand web page development and could use HTML coding to develop a web page successfully.	-click arrow-
44. I am confident I can be successful in an online atmosphere.	-click arrow-
45. I feel I need more interaction with the teacher and other students to be successful in an online course.	-click arrow-
46. I feel confident I can adapt quickly to any technological change or problem during this online course.	-click arrow-
47. I feel as comfortable in an online setting as I do in a traditional classroom setting.	-click arrow-
48. I am excited about taking an online course.	-click arrow-
49. I am confident that the instructor has the knowledge to make the course a learning success for me.	-click arrow-
50. I feel I have the motivation and self-direction necessary to succeed in an online course.	-click arrow-
51. I am comfortable downloading files from the Internet.	-click arrow-
52. I am confident I can use a Web Page Editor (Ex. Adobe PageMill, Microsoft FrontPage, etc.) to develop a web page.	-click arrow-
53. I do not feel comfortable using database software at all.	-click arrow-
54. I do not feel comfortable installing software on a computer.	-click arrow-
55. I am confident I can work in chat rooms or any other live online communication session.	-click arrow-
56. I communicate through Newsgroups on a regular basis.	-click arrow-
57. I am comfortable using Authorware packages (Ex. Macromedia Authorware, Toolbook, etc.)	-click arrow-
58. I do not feel that I could solve a technological problem on my own.	-click arrow-
59. I feel confident I will have the support necessary to over come any problems in this online course.	-click arrow-
60. I feel confident that I can work in groups or on group projects through the online course environment.	-click arrow-

Do you understand that information provided in this questionnaire will be reported in summary form only and that no attempt will be made to indentify you with your completed questionnaire thus ensuring your confidentiality?

● yes ○ no

Click here to review the cover letter again.

Important: When you have completed all questions on the survey, click the Save and Close button below to process the form.

Save &

Thanks Very Much for Your Participation!!!

For more information regarding this study/instrument or to receive a copy of the final report, please email Machelle Davison at davisam@okstate.edu

APPENDIX C

TRANSLATION OF STATISTICAL CODING FOR COMPUTER ATTITUDE, COMPUTER CONFIDENCE, AND COMPUTER LITERACY SURVEY ITEMS

Table 14

Coding Key for Computer Attitude

Code	Survey Question
ca1	Question 7, "I don't have any use for the computer on a day-to-day-basis."
ca2	Question 9, "Using computer technologies, will only mean more work for me."
ca3	Question 10, "I do not think computer technologies will be useful to me beyond this course."
ca4	Question 13, "I am not the type of person who does well with computer technologies."
ca5	Question 14, "Anything that computer technology is used for---I can do better some other way."
ca6	Question 19, "The thought of using computer technologies frightens me."
ca7	Question 25, "I do not feel threatened by the impact of technologies on society."
ca8	Question 29, "I don't see how computer technologies can help me learn new skills."
ca9	Question 31, "Knowing how to use computer technologies will not be helpful to me in the future."
ca10	Question 44, "I am confident I can be successful in an online atmosphere."
ca11	Question 45, "I feel I need more interaction with the teacher and other students to be successful in an online course."
ca12	Question 46, "I feel confident I can adapt quickly to any technological change or problem during this online course."
ca13	Question 47, "I feel as comfortable in an online setting as I do in a traditional classroom setting."
ca14	Question 48, "I am excited about taking an online course."
ca15	Question 50, "I feel I have the motivation and self-direction necessary to succeed in an online course."

Table 15

Coding Key for Computer Confidence

Code	Survey Question
cc1	Question 8, "I am confident about my ability to do well in a course that requires me to use computer technologies."
cc2	Question 11, "I feel at ease learning with computer technologies."
cc3	Question 12, "The instructor helps me feel confident in the course."
cc4	Question 15, "Whether or not I succeed in an online course is up to me."
cc5	Question 16, "Requirements for success in this online course have been made clear to me."
cc6	Question 26, "I am anxious about computers because I am afraid I will mess something up or break something."
cc7	Question 30, "I feel comfortable about my ability to work with computer technologies."
cc8	Question 42, "I feel comfortable that all the resources I need to successfully complete an online course are available to me."
cc9	Question 49, "I am confident that the instructor has the knowledge to make the course a learning success for me."
cc10	Question 59, "I feel confident I will have the support necessary to over come any problems in this online course."
cc11	Question 60, "I feel confident that I can work in groups or on group projects through the online course environment."

Table 16

Coding Key for Computer Literacy

Code	Survey Question
cl1	Question 17, "I am confident I can do any assignment involving word processing skills (Ex. Microsoft Word, WordPerfect, etc.)."
cl2	Question 18, "I understand how a computer functions."
cl3	Question 20, "I am confident I can do any assignment involving spreadsheet software (Ex. Microsoft Excel, Lotus 1-2-3, CorelSuite, etc.)."
cl4	Question 21, "Computer technologies are confusing to me."
cl5	Question 22, "I have never worked with spreadsheet software."
cl6	Question 23, "I understand and can accomplish any task required using spreadsheet software."
cl7	Question 24, "I could use technologies to access many types of information sources on the Internet."
cl8	Question 27, "I understand how to use computers in my school library for literature searches."
cl9	Question 28, "I am confident I can do any assignment involving Internet searching."
cl10	Question 32, "I am confident using email for communication."
cl11	Question 33, "I can do any tasks assigned in a presentation type software (Ex. PowerPoint, CorelSuite, Lotus Freelance)."
cl12	Question 34, "I get frustrated trying to search for information on the Internet."
cl13	Question 35, "I am confident responding to email messages."
cl14	Question 36, "I am confident using databases (Ex. ERIC, PsyLit, etc.) to search for information via the Internet."
cl15	Question 37, "I am confident attaching files to an email message."
cl16	Question 38, "I know how to use computers to manage data in database software (Ex. Microsoft Access, Lotus Approach, etc.)."
cl17	Question 39, "I am confident sending the same email message to more than one person."
cl18	Question 40, "I am confident using Newsgroups to communicate with others."
cl19	Question 41, "I am confident that I can develop a homepage on my own."
cl20	Question 43, "I understand web page development and could use HTML coding to develop a web page successfully."
cl21	Question 51, "I am comfortable downloading files from the Internet."
cl22	Question 52, "I am confident I can use a Web Page Editor (Ex. Adobe PageMill, Microsoft FrontPage, etc.) to develop a web page. "
cl23	Question 53, "I do not feel comfortable using database software at all."
cl24	Question 54, "I do not feel comfortable installing software on a computer."
cl25	Question 55, "I am confident I can work in chat rooms or any other live online communication session."

cl26	Question 56, "I communicate through Newsgroups on a regular basis."
cl27	Question 57, "I am comfortable using Authorware packages (Ex. Macromedia Authorware, Toolbook, etc.)
cl28	Question 58, "I do not feel that I could solve a technological problem on my own."

APPENDIX D

APPROVAL FORM FOR RESEARCH INVOLVING HUMAN SUBJECTS

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 09-18-98 **IRB #: ED-99-017**

Proposal Title: AN ANALYSIS OF GRADUATE AND UNDERGRADUATE ONLINE COURSES: LEARNING STRATEGIES, COMPUTER LITERACY, COMPUTER CONFIDENCE, AND METHOD OF INSTRUCTION

Principal Investigator(s): Bruce Petty, Machelle Davison

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature: Carol Olson Date: October 8, 1998

Carol Olson, Director of University Research Compliance
cc: Machelle Davison

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX E

SUMMARY OF STUDY IN POWERPOINT HANDOUT

An Analysis of Online Graduate and Undergraduate Courses

Purpose of the Study

- To examine differences between graduate and undergraduate students in online courses and describe learning strategies and methods of instruction used by instructors of online courses

Variables Used in the Study

- Undergraduates
- Graduates
- Instructors

- Learning Strategies
- Computer Literacy
- Computer Confidence
- Computer Attitude
- Method of Instruction

Research Questions

- Does computer literacy differ as a function of type of student (graduate or undergraduate)?
- Does computer confidence differ as a function of type of student (graduate or undergraduate)?
- Does computer attitude differ as a function of type of student (graduate or undergraduate)?

Research Questions (cont.)

- Do learning strategies differ as a function of type of online course (graduate or undergraduate)?
- Does method of instruction differ as a function of type of online course (graduate or undergraduate)?
- Do learning strategies differ as a function of type of student (graduate or undergraduate)?

Synopsis of Literature

- The use of computers in schools is important and increasing especially towards online courses.
- Internet resources are very beneficial because they are readily available.
- Support for teachers is lacking (training, prep time, technical).

Literature (cont.)

- Online class- students responsible for self-learning, instructor is a facilitator, students get to choose more, web resources extend student experiences, time and space don't matter.
- Typical audience for distance education is adults.
- Technology is the reason many adult students have returned to school.

Literature (cont.)

- Computers need to be in the hands of students engaging them individualized creations or interactions with other students.
- Teachers have to change their instruction format from traditional forms. More guidance than lecture.
- Faculty had to become more than just content experts.

Literature (cont.)

- Majority of students only have some degree of computer knowledge (word processing)
- Students who are computer illiterate found technology interesting but were scared to use it

Undergraduate vs. Graduate

• 18 to 22 years old	• 23 years or older
• live on-campus	• live off-campus
• full-time student	• work full-time
• require direction	• self-directed
• have to learn	• want to learn

Learning Strategies

- Techniques or skills used by learners to accomplish a specific learning task
  - Navigators feel schedules and deadlines are important. They tend to chart a course for learning and follow it.
  - Engagers love to learn and learn best when actively engaged in a meaningful manner.
  - Problem Solvers test assumptions, generate alternatives, use many external aids, and identify many resources.

Research Design

- ATLAS Survey used for both instructors and students
- Instructor survey used to identify method of instruction and issues related to online courses (prep time, support).
- Student survey used to identify computer literacy, computer confidence, and computer attitudes.

Population and Sample

- 22 online education courses were selected randomly from CASO's list of 90 online education courses
- The 22 consisted of 12 graduate courses and 10 undergraduate courses
- Geographically from across the United States and Canada

Research Question #1

- Analyzed using Regression to compare computer literacy of graduate students versus undergraduate students
- No statistically significant difference was found (.857)
- Most own a computer and use it daily

Men felt more literate than women. One of the lowest computer literacy means was in using Authorware type applications.

Research Question #2

- Analyzed using Regression to compare the computer confidence of graduate and undergraduate students
- No statistically significant difference found (.367)

Felt success was up to them, afraid to mess something up (more women), didn't feel supported or helped by instructors

Research Question #3

- Analyzed using Regression to compare the computer attitude of graduate and undergraduate students
- No statistically significant difference found (.532)

all felt computer technologies were important and useful, men slightly more than women, didn't feel they needed more interaction with participants (Chute)

Research Question #4

- Analyzed using Descriptive statistics including frequencies and means to compare learning strategies of instructors teaching graduate and undergraduate courses

Navigators (44%)

Engagers (33%)

Problem Solvers (22%)

Research Question #5

- Analyzed using Descriptive statistics including frequencies and means to find out the percentage of instructors in graduate and undergraduate courses using each method of instruction

Research Question #5

- Reference to Online Sources (41%)
- Individual Projects (39%)
- Lecture (22%)

- Large Groups
- Online Presentations
- Class Discussion through Newsgroups

Chat, discussion, group activities used only a little while lecture still used a lot.

Research Question #6

- Analyzed using Chi-Square to categorize students of online graduate and undergraduate courses by their learning strategies

Navigators (41%)
Problem Solvers (30%)
Engagers (28%)

Grad vs. Undergrad

- Navigators (44%)
- Engagers (28%)
- Problem Solvers (28%)

- Navigators (35%)
- Problem Solvers (35%)
- Engagers (29%)

Correlation

- Used in the study to determine if there was a significant relationship between
  - learning strategies
  - gender
  - age
  - classification
  - computer confidence
  - computer literacy
  - computer attitude

Correlation

- Significant Relationship found between:
  - gender and computer literacy (.018)
  - gender and computer attitude (.009)
  - computer attitude and computer confidence (.000 for last three)
  - computer literacy and computer confidence
  - computer literacy and computer attitude

Women were sightly less comfortable using computer than men. Variables may be testing the same thing.

Additional Instructor Facts

- had taught an average of 3.9 online courses
- had taught online and average of 14 months
- needed 2.4 months to prepare an online course
- Had little technical assistance
- used a homepage for announcements
- felt online courses are definitely more challenging than traditional courses

Additional Student Facts

- Almost 3/4 of students were over age 35 and all were over age 21
- more females (65%) than males (34%) were enrolled
- 87% owned their own computer and used computers on a daily basis

Summary

- Students and Instructors were Navigators and require a course for learning, schedules, direction, etc.
- males were slightly more computer literate and had a better attitude toward computers
- Student classification made no difference when comparing computer literacy, attitude, and confidence

Summary (cont.)

- Students felt strong about their abilities to succeed and use computer technologies in an online environment but lacked confidence in support from instructors, communication through Newsgroups, and the use of Authorware applications.

Implications

- Instructors need support through training, technical assistance, and more prep time
- Instructors still need to move beyond traditional methods of instruction incorporating more group and individualized activities
- Institutions can benefit by targeting adults for online courses

Implications (cont.)

- Online instruction should be designed in an organized manner with a schedule and objectives to help Navigators succeed

Future Research

- Combine the three computer variables into one and analyze the survey again
- Use the three computer variables to analyze instructors as well as students
- Broaden the scope (different regions, different institutions, different online course applications)
- Study only graduates or undergraduates and only men or women, not together
- use a better survey distribution method

VITA

Machelle Davison

Candidate for the Degree of

Doctor of Education

Dissertation: AN ANALYSIS OF GRADUATE AND UNDERGRADUATE COURSES: LEARNING STRATEGIES, COMPUTER LITERACY, COMPUTER CONFIDENCE, AND METHOD OF INSTRUCTION

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