INVESTIGATION OF STUDENT LEARNING STRATEGIES AND SATISFACTION IN ONLINE DISTANCE EDUCATION COURSES

by

NANCY PLISKA ROBINSON

(Under the Direction of Roger B. Hill)

ABSTRACT

Designing suitable learning environments requires an understanding of the learner. As a result, this study examined the levels of participation, self-efficacy, self-regulated learning strategies (SRLS), prior computer experience, and gender to help educators focus on why students were satisfied with their online course experience. This knowledge will be more beneficial to instructors rather than focusing on comparisons of traditional face-to-face to technology-assisted online instruction. Since the debate is not which method is better but whether distance education is responding to learners' needs, evaluating each course based upon individual learner characteristics will provide further insight into the most effective methods of delivering instruction online.

A causal-comparative design was used to achieve the design objectives. Two survey instruments were created: an online self-efficacy and learning strategies survey and an online satisfaction survey. Validation procedures, pilot tests, and final instruments were administered over a six-month period to students enrolled in different asynchronous online distance education courses at a major southeastern university. In addition, a quantitative analysis of text-based

bulletin board discussions was performed to determine levels of participation. This study examined separately two online courses of 15 and 11 participants.

A one-way analysis of variance (ANOVA) did not support differences in satisfaction between low, medium, and high levels of students' self-efficacy for either sample. However, differences in satisfaction between levels of SRLS were supported for one sample. Levels of participation were measured with scores derived from formulas developed for participation-presence (PP) and participation-interactivity (PI). An ANOVA did not reveal any statistical significance in satisfaction for levels of participation in online discussions. Results from independent samples *t* tests were not statistically significant with respect to novice and expert categories of scores measuring prior computer experience.

A tangential result of this study was the development of reliable instruments to measure prior computer experience, self-efficacy, SRLS, and satisfaction. This study represents an in-depth analysis of the complex characteristics of students' satisfaction with their online course experience with the expectation that this will provide important information about what constitutes success for students and instructors.

INDEX WORDS: Self-efficacy, Self-regulated learning strategies, Prior computer experience, Participation, Satisfaction, Distance education, Online, Motivated strategies for learning, Social cognitive theory, Transactional distance, Computer-mediated communication, Gender, Asynchronous, Synchronous

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DEDICATION

This dissertation is dedicated to my daughter, L. M. Pliska Robinson.

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INTRODUCTION

Background of the Problem

According to a report released by the U.S. Department of Education's National Center for Education Statistics (NCES), the number of enrollments in postsecondary online distance education courses was an estimated 3,077,000 in the 2000 academic year (Waits & Lewis, 2003). Distance education, where student and teacher are connected by technology instead of a classroom, is in position for considerable growth over the next several years (Schrum, 2002). The most significant influence in provisions of distance education has been the recognition of the Internet as a method of delivering courses online (Arsham, 2002).

In a 1998 study of 280 college students, 71.8% owned a computer and 73.6% had Internet access (Hanson & Jubeck, 1999). The unprecedented ease of communication between individuals and the availability of access to information because of technological advancements opened up remarkable educational and entrepreneurial opportunities. The rise in the availability of technology-supported distance education provides individuals the opportunity to increased access to postsecondary education. Ready access to technology has encouraged postsecondary education institutions to consider seriously the potential growth of online distance education programs. The advent of the Internet brought about an increasing realization that education did not have to be constrained by time or location. The American Federation of Teachers (AFT) issued a trend report in 2001 (Kriger) that referenced a Merrill Lynch forecast, "The distance education market would reach $7 billion by 2003" (p. 5). According to an interview with

Kenneth Green (Morrison, 1999), founder and director of the Campus Computing Project, "Certain there is gold in [online] distance education, many campus and public officials believe that institutions absolutely must be there ahead of (or at least shoulder-to-shoulder with) the competition: other colleges and universities, commercial ventures, and in-house corporate training centers" (question 3). Green's ongoing project, which began in 1990, represents a continuing study of the role of computing and information technology in American higher education.

Distance education encompasses a variety of educational programs and activities. Its beginning is associated with correspondence education, which started in Europe and the United States in the mid 19 century (Belanger & Jordan, 2000; Keegan, 1986, 1996). Correspondence courses were originally established to provide education for individuals unable to participate in coursework offered in traditional classroom settings. The postal system was the mechanism used for delivering course materials (Matthews, 1999). Much like correspondence courses, online distance educations' students and instructors are geographically separated and some form of technology is used to deliver instruction (Keegan, 1986).

The types of online distance education instruction delivered through computer networks can be categorized as asynchronous or synchronous. Asynchronous refers to instruction that occurs anytime or anywhere, whereas synchronous refers to real-time interaction between the instructor and learner (Belanger & Jordan, 2000). Sometimes there are synchronous components to asynchronous online courses. Participation in chat rooms occurs in real time and is synchronous; however, this might not be a required day-to-day activity. Some instructors meet face-to-face with their class for the first class period and once a month after that in an attempt to create the social aspects of face-to-face courses. Perhaps the most successful online courses are a

blend of asynchronous and synchronous events, with approximately 80% spent on self-paced online materials and the remaining 20% in interactive sessions with the instructor and other students (Lister, Danchak, Scalzo, Jennings, & Wilson, 1999). The percentages are not absolute, but allocations emphasize the importance of some synchronous components to an asynchronous online distance education class.

In contrast, within traditional place-based classrooms, instruction occurs in a classroom inside a school, college, or university setting, where teacher and students are physically present at the same time and same place (Keegan, 1986). Curriculum characteristics focus on breadth of knowledge. In some instances, technology is used as a source of information for assimilation of knowledge (Grabe & Grabe, 2001). Communication technologies are sometimes used to supplement and enhance learning environments by providing educational options that support collaboration and knowledge building (Harasim, 1999; Harasim, Hiltz, Teles, & Turoff, 1997).

Although some course material and teaching techniques are more suited for traditional classroom settings, an extensive variety of subjects can be successfully offered online. The relevant question is not whether a course can be prepared for online delivery, but what will be the most effective media (physical means of communication, e.g., computer) mix for achieving the courses' goals given the geographic distance of students and other constraints (R. Gagne & Briggs, 1979; Harasim et al., 1997). Studies support a learner-centered (instead of teacher-centered) approach as the best method for online classrooms (R. Gagne, 1986; R. Gagne, Briggs, & Wager, 1988; Reiser & R. Gagne, 1983). Communication networks facilitate sharing ideas, information, and skills among students in order to build and apply knowledge. Furthermore, the sharing of ideas and collaborative tasks has been found to be successful in online settings

(Bernard, Rojo de Rubalcava, & St-Pierre, 2000; Dede, 1996; Harasim et al., 1997; Passerini & Granger, 2000).

Clarifying the definition of distance education has been the subject of considerable debate among instructional technologists since it represents a variety of educational programs and activities. Desmond Keegan (1986), former Director General of the Italian Distance University Consortium declared, "'Distance education' is a suitable term to bring together both the teaching and learning elements of this field of education" (p. 34). The term distance education corresponds to the concepts of distance learning (Sherry, 1996). Although distance learning can be referred to as either formal or informal learning experiences, distance education refers specifically to formal instruction conducted at a distance by a teacher who plans, guides, and evaluates the learning process. Distance learning is the process of interaction between student and teacher that is organized with all the components typically used for the educational process (Bruce, 1999; Holmberg, 1986). The teacher and learner are separated and face-to-face communication is replaced by the intervention of technology for delivering instruction (Holmberg; Keegan, 1996; S. Wang, 1994). Garrison and Shale (1987) proposed a definition that encourages flexibility and future development:

1. Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguously.
2. Distance education must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process.
3. Distance education uses technology to mediate necessary two-way communication. (p. 11)

For the purposes of this study, online distance education was defined as the delivery of instruction facilitated by the Internet and computer technologies that can occur asynchronously (anytime, anywhere) or synchronously (real time), without the constraint of having students in the same location as the teacher. There are three important aspects for consideration in an online distance education environment: (a) interaction between the teacher and learner, (b) flexibility and responsiveness in course design, and (c) learner autonomy where learners manage their own learning and construct their own knowledge.

In the report commissioned by the National Education Association (NEA) for Institute for Higher Education Policy (IHEP), Phipps and Merisotis (1999) brought to light several problems with prior research on the effectiveness of distance education. In particular, attention was given to the accuracy of Russell's *The No Significant Difference Phenomenon*. According to Russell's (1999) annotated bibliography of comparative research on technology-based instruction versus conventional teaching methods, no significant difference was shown between the methods. His compilation included studies as far back as 1928. Russell further proclaimed, "The good news is that these no significant difference studies provide substantial evidence that technology does not denigrate instruction. This fact opens doors to employing technologies to increase efficiencies, circumvent obstacles, bridge distance, and the like" (p. xiii).

Regardless of Russell's proclamations, Phipps and Merisotis (1999) seriously questioned the validity of at least 75% of the research comprising the comparative studies in the report. They limited their review to over 40 original works of research published during the 1990s. The works examined represented courses using several different types of technologies, not just Web-based or computer-based courses. For example, one study compared students' attitudes for several two-way interactive video courses. Another examined take-home essay exam results for

students participating in a live broadcast televised graduate course in relation to students in on-campus classrooms. Phipps and Merisotis believed that because research suggested there was no difference in student performance, reasoning was insufficient to imply online distance education was any better than other instructional methods. In fact, the only valid conclusions that could be reached were that it was as effective.

During their analysis, Phipps and Merisotis (1999) uncovered the fact that original research related to the effectiveness of online distance education was scarce. Their review encompassed material published during the 1990s and focused on current technologies used by the majority of institutions. They observed that the studies reviewed primarily paid attention to students and teachers' perception of online distance education courses. Generally, the studies found that students performed as well as or better than their counterparts did in settings that were more traditional when grades and test scores were used as measures of effectiveness. They maintained that the research findings were seriously flawed due to a lack of (a) emphasis on student outcomes in total programs; (b) accounting for differences in gender, age, educational experience, and motivation; (c) consideration for differences in learning styles and student's use of certain technologies; (d) theoretical or conceptual framework; and (e) investigation of adequacy of digital libraries. Just as Phipps and Merisotis were critical of Russell's conclusions, Moore and Thompson's (1990) earlier review of comparative studies was just as disparaging. They noted that several research studies demonstrated weak designs, particularly with respect to control of the populations being compared, the treatments given, and the application of statistical techniques.

In addition to the problems Phipps and Merisotis (1999) presented regarding the limitations of the findings in original research on distance education, they also questioned the

range of documents cited in Russell's book, *The No Significant Difference Phenomenon*. Their primary concern was related to the fact that many of the papers and summaries cited similar research and as such, contained considerable cross-referencing. They further indicated that several of the studies were not original research studies. As a result, Phipps and Merisotis argued that the numbers of studies with no significant difference were exaggerated and the conclusions of Russell's report were misleading.

Even though a great deal of attention has focused on documented studies of no significant difference, several problems have yet to be addressed about comparative research. For one thing, the instructional method (traditional or distance) is often considered the independent variable. Researchers compare distance education to traditional classrooms with respect to performance measures such as test grades, dropout rates, and critical thinking skills (G. Brown & Wack, 1999). The researchers conducting the studies ask the same fundamental question, "Is distance education as good as, or better than, traditional education?" What is implied is that "traditional" education is the optimum delivery method and should be the standard for judging alternative instructional methods. In many respects, such an inference is faulty since there is no conclusive method for determining which type of instructional delivery is better (Burbules & Callister, 2000). At best, researchers can accurately interpret only what the studies measure, not what they "don't."

Another problem with comparative research is that it seldom defines what is meant by *traditional,* or for that matter *distance,* education. Saba (1998) observed, "I still see a comparative study now and then, but the new ones, as well as the older ones, fail to adequately define 'traditional' education or present a sufficient differentiation between traditional education and mediated education" (para. 1). Without clearly defining the processes being compared, any

conclusions about the effectiveness of one mode of instruction over another are not justifiable. It stands to reason, the issue of research validity will dilute the meaningfulness of specific assumptions, particularly when there can be material differences in outcomes across various disciplines and courses, thereby making comparisons invalid (Gall, Gall, & Borg, 2003). Furthermore, efforts to compare distance and traditional programs are problematic, since online distance education and traditional on-campus programs are becoming increasingly integrated (G. Brown & Wack, 1999).

Despite these concerns, comparative studies may not be as defective as alleged. G. Brown and Wack (1999) suggested that online distance education research has unjustly faced a more stringent burden of proof than other scientific and educational research. For this reason, Phipps and Merisotis (1999) maintained that comparative studies needed to focus on pedagogy by arguing the following:

> Although the ostensible purpose of much of the research is to ascertain how technology affects student learning and student satisfaction, many of the results seem to indicate that technology is not nearly as important as other factors, such as learning tasks, learner characteristics, student motivation, and the instructor. (p. 31)

Even though overall results of comparative studies between traditional and online distance education classes have been indecisive, there is one aspect upon which several researchers and education professionals consistently agree (Carnevale, 2002). More studies should direct their attention to whether students are engaged in learning and effectively communicating their progress and enthusiasm to the teacher (Kozma, 1994a, 1994b; Phipps & Merisotis, 1999; Reeves, 1997; Rockwell, Furgason, & Marx, 2000). In all likelihood, students will learn regardless of the instructional delivery method (Clark, 1994; Russell, 1999). However,

it is important for instructional designers and curriculum developers of online distance education courses to understand how distance education transverses traditional notions of education. Trying to determine how much better nontraditional methods of instruction are compared to traditional may not be as productive as dealing with the underlying issues of learner characteristics in the online distance education process (Bernard et al., 2000; Web-based Education Commission, 2000; Merisotis & Phipps, 1999; Sherry, 1996).

In order to establish which elements of online distance education courses are expected to positively interact with learner characteristics, a few research studies have investigated more complicated relationships to facilitate an understanding of what is actually affecting student learning (Meyer, 2002). For example, Pintrich and De Groot (1990) conducted a correlational study that examined relationships between motivational orientation, self-regulated learning strategies, and achievement for 173 seventh graders in science and English classes. A Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1991) was developed to measure students' self-efficacy, intrinsic value, test anxiety, self-regulation, and use of learning strategies when completing classroom assignments. Regression analyses showed that self-regulation, self-efficacy, and test anxiety materialized as the best predictors of performance. However, students' intrinsic value had no direct influence on performance, although results indicated it was strongly related to self-regulation and cognitive learning strategies. Chen's (2002) correlational study investigated effective self-regulated learning strategies in a lecture-led versus a hands-on computer lab-learning environment for an information systems course. The participants were 197 undergraduate students enrolled in business information systems. The findings revealed that effort regulation had a positive effect and peer learning had a negative effect on learning computer concepts. In another study, Wells (2000) examined the effects of an

online distance education course on students' internal and external concerns toward using the Internet for instructional purposes, taking into account prior computer and Internet knowledge, as well as individual learning styles. Thirteen technology education graduate students were involved in the study. The results were mixed and showed that prior computer experience was not significantly related to internal stages of concern.

Research providing data was not found on the effect of levels of self-efficacy, self-regulated learning strategies, prior computer experience, participation, and gender on satisfaction in online distance education courses. Previous studies have primarily focused on students' attitudes as predictors of learning (Arbaugh, 2001; Huang, 2002; O'Hanlon, 2001; Rosenkrans, 2001). However, a study conducted by Chang (2000) categorized different levels of computer proficiency in examining the effects of attitudes, self-efficacy, and performance of college students in an online distance education course. Fahy, Crawford, and Ally (2001) analyzed interaction patterns of 13 students for a descriptive study that reported on types of interactions and levels of participation in online discussions. Hara, Bonk, and Angeli (2000) investigated online discussion content in a mixed-method study of students in an educational psychology course of 20 graduate students.

Designing suitable learning environments requires an understanding of the learner. Learner profiles, which represent characteristics that affect how learners interact and participate in a particular online environment, may include measures of prior experience, learning strategies, age, gender, or other characteristics (Aviv, 2000; Baker & Hale, 1997; Bernard et al., 2000; Spiceland & Hawkins, 2002). Learners' profiles are a catalogue of all the aspects that make one learner different from another and that can be proven pertinent to satisfaction in an online distance education environment. Examining the levels of participation, learning strategies, prior

computer experience, and gender will help educators focus on why students and instruction are successful or not successful in an online setting. This understanding will be beneficial to instructors rather than focusing on comparisons of traditional face-to-face instruction to technology-assisted online instruction.

Statement of Purpose

The purpose of this study was to examine the effect of the level of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender on satisfaction among students enrolled in university online distance education courses. Instruments were developed to measure students' self-efficacy levels with online Web-course tools (electronic mails, bulletin board discussions, and chat sessions), prior computer experience, students' self-regulated learning strategies, and satisfaction. Levels of participation were based upon an analysis of interaction patterns and structural features of online discussions. Total scores on a self-report questionnaire that contained both demographic questions (including gender) and Likert-type scale responses measured satisfaction. Analysis of variances and independent samples *t* tests were used to develop a profile of learner characteristics that provided the most benefit for improving students' satisfaction in an online distance education class.

Research Questions

1. How did students' satisfaction differ with respect to their level of self-efficacy in an online distance education course?
2. How did students' satisfaction differ with respect to their level of self-regulated learning strategies in an online distance education course?
3. How did students' satisfaction differ with respect to their level of prior computer experience in an online distance education course?

4. How did students' satisfaction differ with respect to their level of participation in an online distance education course?

5. How did students' satisfaction differ with respect to their gender in an online distance education course?

Theoretical Framework

The assumption of individual learning, autonomy, and teacher-learner separation are implicit in the definition of distance education. The theories that guide online distance education and help isolate the factors that influence students' satisfactions are the theory of transactional distance and social cognitive theory.

Transactional Distance

One of the first attempts at articulating a theory of distance education was presented by M. Moore (1973). The basis of Moore's theory was derived from Dewey and Bentley's (1949) concept of transactionalism. This has been referred to as the theory of transactional distance. Dewey and Bentley's notion of "trans-action" conceptualized technology as a discrete object that interacted with a social system. Transaction referred to the connection between any event and its environment. Technology was the event and technological systems were the environment. Their observations were an attempt to understand the way technology occurred in technological systems (Ratner & Altman, 1964). Building on this foundation, Moore suggested that the distance between learners and teachers was something more than just a geographic separation. This distance is in fact an important feature of educational transactions and is metaphorically implied even though the instructor and student are not separated geographically (Davidson-Shivers, Tanner, & Muilenburg, 2000; Lally & Barrett, 1999; M. Moore, 1991; Saba, 1988).

Since the theory of transactional distances includes the distance that exists in all educational relationships, it follows that it also describes the patterns of behavior between teachers and learners who are separated from one another. Due to communication gaps created by distance, there can be significant misunderstandings between the instructor and learner that can result in unfavorable psychological or emotional consequences. As a result, teaching methods at a distance cannot be the same as conventional ones. Special procedures have to be adopted, and choosing the proper one depends upon two communication variables: dialogue and structure (M. Moore, 1991). Dialogue refers to interactions that result from giving and receiving instruction between the teacher and learner. Dialogue can be a component of either asynchronous or synchronous online courses. Structure refers to the communication media used to deliver instruction. It describes the degree to which an education program accommodates or is responsive to learner's individual needs. Some online distance education courses are highly structured with little or no opportunity for deviation from the original course outline. Additionally, direction and guidance from the teacher are missing. Thus, the relationship that exists between dialog and structure has a greater impact than the actual geographic distance between teacher and learner (Lally & Barrett, 1999). The degree to which both variables exist determines the transactional distance present in a program of instruction (Saba, 1988). That is why transactional distance is relative and different for each person and for each distance education program.

Social Cognitive Theory

The characterization of distance education by the separation of the teacher from students has changed institutional control over learners. Instead, students are learning together in cyberspace, the virtual space of network systems that connects users in electronic classrooms

(Harasim, 1997; Harasim et al., 1997). In online distance education, students may never see their instructor face-to-face. Interactions that once occurred between students in face-to-face classrooms do not exist for online students. Students are independent of the classroom and faculty control. As a result, students may not receive an equitable quality of support, connectedness, and instant feedback from instructors and peers that would normally be obtainable in a conventional learning environment (Howard & Discenza, 2000). Due to the nature of the learning environment in online distance education classes, self-efficacy and self-discipline become important factors in students' success or failure. Since distance learners must take responsibility for much of their own motivation and cognition, theories of self-regulated learning strategies are significant (Corno, 1998; Corno & Mandinach, 1983; Pintrich & De Groot, 1990).

Social cognitive theory defines motivation in terms of students' self-efficacy and self-regulated learning strategies (Bandura, 1986, 1989, 1993, 1994, 1997). Bandura's (1986) triadic theory of social cognition involved three conditions: (a) cognitive and other personal processes, (b) environment, and (c) behavior. The development of these factors is interdependent and reciprocally affects each other. Zimmerman (1989) provided three advantages of social cognitive theory in explaining self-regulated academic learning:

> (a) It distinguishes the effects of personal self-regulatory influences from overt behavioral ones and can explain the relative advantage of each; (b) it links students' self-regulatory processes to specific social learning or behaviorally enactive experiences and can explain their reciprocal impact; and (c) it identifies two key processes through which self-regulated learning is achieved, self-efficacy perceptions and strategy use, and can explain their relation to student motivation and achievement in school. (p. 337)

According to social cognitive theory, self-regulatory skills are learned from social and self-directed experiences (Zimmerman, 1998). Learning from social experiences occurs through modeling (Bandura, 1986, 1991b). These social influences or models include parents, peers, or teachers. Learning also occurs through personal discovery. The development of self-regulatory skills can take long hours, even years of practice to obtain fully (Zimmerman). Similarly, academic self-regulatory skills develop through a series of stages, i.e., observation, emulation, self-control, and self-regulation (Zimmerman, 2002). This regulatory behavior manifests in goal setting, self-rewards, and selecting a place to study. Learners must want to engage in self-regulation. They consciously choose the self-directed metacognitive, motivational, and behavioral skills that characterize self-regulation. Zimmerman (1998) informed us that self-regulated learners believed learning was something they must have done for themselves, as active participants, rather than as something that was done for them.

In addition to the self-regulatory skills required for successful learning to take place, social cognitive theory holds that learners must also learn to regulate their self-efficacy beliefs. Zimmerman (1989) maintained self-efficacy was analogous to a thermostat whereby it regulated efforts to acquire knowledge and skills. These beliefs influence students' academic behavior through four major processes: (a) cognitive, (b) affective, (c) selection, and (d) motivational aspects (Bandura, 1993, 1994, 1997). In fact, it is students' beliefs in their efficacy to regulate their own learning and to master academic activities that determines their aspirations and level of satisfaction (Bandura, 1993). Efficacious students choose to engage in tasks, expend effort, and persevere in overcoming obstacles in order to succeed (Bandura, 1986; Schunk & Zimmerman, 1997).

Delimitations

1. The causes of variation in students' learning strategies and satisfaction because of different teaching approaches of the courses used for this study were not investigated. The study's focus is limited to a description of a particular population for each course. Phipps and Merisotis (1999) were of the opinion that total academic programs delivered online should be investigated instead of looking at individual courses. Due to inaccessibility to these programs, an examination of relationships between levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender was made; however, underlying reasons for these differences were not established.

2. Results of this study focused on a restricted segment of students registered in higher education online courses using different software to augment asynchronous delivery. Since differences in technology and interaction of multiple technologies may affect online participation in various ways, an in-depth look at the synergistic consequences of multiple technologies was beyond the scope of this study.

3. Given that participants were selected on a volunteer basis instead of randomly, mortality and selectivity of students were issues. Due to the restrictions of sampling range, the design's major drawback is that the results are not generalizable, which makes it difficult to represent any positive conclusions regarding cause-and-effect. The incentives offered for completing the study is believed to reduce mortality.

4. In the preparation of scaled responses for the self-report instruments designed for this study, an attempt was made to eliminate distortions. However, with self-report questionnaires, it is impossible to determine all questions and all possible answers. Therefore, the underlying motives or reasons for some answers cannot be determined (Gillham, 2000).

Significance of the Study

Due to the introduction of the Internet and developments in network and communication technologies, the fundamental characteristics of the field of online distance education has been transformed. Recent developments in technology and ease of access have provided increased communication, interaction between participants, and incorporation of collaborative environments. Online distance education has grown to represent more than the distribution of materials for correspondence courses (Heerema & Rogers, 2001). Most courses require some form of community building through two-way communication between the teacher and students (J. Hill & Raven, 2000). Therefore, it is essential that educational institutions encourage more active student involvement, quality design, and effective teaching and learning strategies in order to provide sound pedagogical design for online distance education programs.

Due to increases in Internet use in higher education, learners' methods of acquiring information are changing. There is a need to reevaluate how knowledge skills are acquired, how learning in distance education environments takes place, and how online instruction can best be facilitated (Winne, 1995a). Resulting changes in educational environments compounded by technological innovations necessitate determining how students interact and which design elements of an online distance education course are likely to positively affect learner characteristics (Merisotis & Phipps, 1999; Winne). Technology in online distance education classes may have a more important effect on learners in some situations than others due to individual differences in performance and variations of interaction between task, learner, and technology (Wolfe, 2001).

Mostly, educators need to understand how different types of learners learn in a distance education environment and how learner attributes affect the learning process and learner

performance (Diaz & Cartnal, 1999). According to a report prepared for the Institute for Higher Education Policy (IHEP) by Phipps and Merisotis (1999), “Learner characteristics are a major factor in the achievement and satisfaction levels of the distance learner” (p. 26). They further suggested that research in online distance education should concentrate on learners’ distinctive characteristics. This study attempted to do that by developing a profile of learners’ proficiencies and experience. This will enable instructors to design course content more effectively. Achieving that objective also allows competent preparation of students for the workplace (Schrum, 2000b).

Online distance education compels educators to contemplate alternative thinking about instructional design since the learning environment, tools, and methods related to it are different from traditional education. According to G. Moore (1991), in distance education, “The separation of teacher and learner is so significant that it affects their behaviors in major ways, and requires the use of special techniques, and leads to special conceptualization” (para. 6). What follows then is the traditional classroom is no longer the only place for education. What many researchers maintain is that the traditional paradigm of a university that provides mainly passive instruction is shifting to a new learner-based paradigm (Sims, Dobbs, & Hand, 2002). With the traditional paradigm, teacher-centered instructivist learning theory supports the view that knowledge exists independent of the learner (Reeves, 1997). Freire referred to this form of education as the “banking model” whereby the teacher “resembles someone putting money into a bank, the students being regarded as empty receptacles into which the teacher deposits knowledge” (as cited in Crotty, 1998, p. 153). However, in a learning paradigm, constructivists allow students to explore and create their own meanings (Jaramillo, 1996; Jonassen, 2000; Jonassen, Davidson, Collins, Campbell, & Haag, 1995; Reeves). Questions pertaining to learners’ capabilities and the conditions that facilitate learning are appropriate. Theoretical

significance lies in conceptualizing online distance education as a process that promotes knowledge construction along with self-regulation and multiple perspectives. Testing these constructs is important for ensuring successful knowledge transfer and concept formation in a learning paradigm.

Online distance education relies on computer-mediated communication (CMC) technologies and the Internet for its delivery. Computer-mediated communication uses tools such as electronic mail (e-mail), fax, and bulletin board discussions to provide interaction and communication between individuals engaged in an online distance education environment (Belanger & Jordan, 2000; Garrison, Anderson, & Archer, 2001). Due to the complexities of computers, software packages, and Web-based tools, online students can experience difficulties using CMC technologies. If they are inexperienced, they may become apprehensive and anxious. As such, they may develop a negative attitude regarding use of computers to access online instructional materials and in attaining academic success. Students' attitudes about their ability to accomplish a task or successfully complete an activity are determined by their self-efficacy beliefs (Bandura, 1989, 1994, 1997; Bandura & Locke, 2003). Self-efficacy frequently determines initial attempts at performance as well as persistence (Corno & Mandinach, 1983). Online self-efficacy beliefs represent students' attitudes about their capability for performing academic tasks with Web-based tools in an online distance education setting. By determining students' online self-efficacy beliefs at the beginning of a course, this study will help instructors in deciding if additional training is necessary for enhancing students' overall experience using computers and information technologies to engage in learning.

Students learning in isolation have no one alongside them to measure their ideas and assess their comprehension. In online distance education settings, some students have difficulty

dealing with a different support system other than a traditional institution-based one. Particularly with asynchronous courses, instructors rarely see their students and course delivery methods rely primarily on computer technology (Ely, 2001). Since asynchronous courses are mostly Web-based, threaded discussion groups and e-mail are used extensively. Students are allowed to work at their own pace and seldom communicate face-to-face with their instructors (NEA, 2000a, 2000b; Phipps & Merisotis, 2000). For these reasons, developing an understanding of the concept of self-regulation is important in increasing students' capabilities and satisfaction for teachers and students alike (Bandura, 1993; Butler & Winne, 1995; Chen, 2002; Pintrich & De Groot, 1990; Schunk & Zimmerman, 1997; Zimmerman, 1989, 1998, 2002).

Of particular interest to educators are the personal characteristics that enable learners to be independent and adaptable. These characteristics are generally associated with self-regulation (Winne, 1995a). Therefore, understanding students' self-efficacy as a contributing factor in self-regulation of academic tasks is integral to determining which cognitive factors are influential in satisfaction (Bandura, 1986, 1989, 1993, 1994, 1997; Corno & Mandinach, 1983; Zimmerman & Kitsantas, 1999; Zimmerman & Martinez-Pons, 1990). With the growing interest in online distance education, it is essential that educators understand how students learn online, their methods of interaction with online teaching material, the benefits of this material, and the 'why' and 'how' of their online behavior. Hence, results of researching the psychology of online behavior such as self-efficacy and self-regulation contribute to the design of educational materials (A. Johnson & Buchanan, 2001). With this information, instructors can make students aware of effective self-regulated learning strategies in online distance education environments and help students apply these strategies appropriately in subsequent leaning situations. By

choosing instructional preferences in which students are successful and able to expand their proclivity for learning, they will learn better and become more successful.

In order to handle the complexities of teaching online distance education courses, instructors also need information on the effects of prior computer experience on satisfaction (Osika & Sharp, 2002). In an online course setting, prior computer experience has been related to frequency in logging on to a course's website, amount of time spent logged on to a course's website, and the likelihood of taking additional online distance education courses in the future (J. Hill & Raven, 2000; Rosenkrans, 2001). To develop experience adequately, students have to spend time using computers to complete a range of tasks. Students who spend more time participating in online courses are more likely to be satisfied with the experience, will take possession of their learning process, and will increase their own learning accordingly. What follows is that the additional experience with online distance education courses is expected to increase their satisfaction toward a program of study and increase their perceived performance skills (Arbaugh, 2001; Bernard et al., 2000; Debowski, Wood, & Bandura, 2001). This study examined the importance of prior computer experience and students' satisfaction with their online course.

The importance of the function of various types of interaction in the learning process has been highlighted in initial research on Web-based courses (Holmberg, 1989). In the framework of distance education, interaction has been defined in terms of four dimensions: (a) learner-to-instructor, (b) learner-to-learner(s), (c) learner-to-content, and (d) learner-to-interface (Hillman, Willis, & Gunawardena, 1994; Moore, 1989). Learner-to-interface refers to the interaction that takes place between the learner and the technology used for course delivery (Hillman, 1997; Hillman et al.). Due to the asynchronous nature of Web-based courses, i.e., noncontiguous

communication, participation of both students and the instructor is critical for a successful online distance education course (Abrahamson, 1998). According to studies conducted by the State University of New York (SUNY) Learning Network (Fredericksen, Pickett, Shea, Pelz, & Swan, 1999), when online discussion is graded, valid, participation is frequent, and interactions are positive and enthusiastic, students' satisfaction increases.

In traditional education, interpersonal communication is usually one-to-many or one-to-one and evaluations are used to assess students' performance. In contrast, online distance education courses are mainly based on collaborative learning models, where communication between students makes evaluation possible through observation of participant interaction and collaboration (Henri, 1988, 1992). One aspect that distinguishes online distance education from previous forms is that learning can be a much more social process rather than an individual one (Benigno & Trentin, 2000). In a traditional place-based environment, most assignments are carried out as private communication between the teacher and student. Collaborative activities are possible; however, they are limited by students' abilities to be able to meet face to face. With CMC, course activities can be designed collaboratively. Another distinguishing factor is that with online computer conferencing, the primary means for communicating is text-based. Thus, by analyzing communication, this study yields information on areas of participants' learning profiles and factors that contribute to a successful online experience (Fahy et al., 2001).

Despite the flaws in comparative studies that Russell highlighted (1999), they were beneficial in assuaging educators' fears that online distance education instruction was not as adequate as face-to-face modes of delivery. Straightforward comparisons are researchers' first venture in evaluating whether the technology works or that certain types of Web-based instruction are effective. Regardless of the fact that most comparative studies are simple in

design, i.e., student samples do not match or control groups are not used, the outcomes are still valuable for helping educators test the technology for themselves. Even though study designs of online distance education courses are widely criticized, it is the right of every researcher to investigate issues that are more fundamental before investigating ones that are more complicated (Joy, II & Garcia, 2000). The pervasiveness of comparative studies may be perceived as an essential first step toward evaluating the effectiveness of technologies and techniques used in implementing online distance education programs.

Having a complete understanding of students' personal characteristics, proficiencies, and experiences with Web-course tools provides instructors the reasons necessary for understanding success and satisfaction of students in the context of online distance education settings. The instruments designed for this study are useful for identifying students' self-efficacy beliefs, self-regulation, and satisfaction within an online environment, which may indicate obstacles to academic achievement because students remain unsatisfied and perceive that they have little control over their learning environment. A review of the literature revealed no other study had been previously undertaken that examined overall satisfaction with different levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender in online distance education courses. Although data from this study is not generalizable outside of the samples used, some conclusions can be drawn using this study's instruments and data along with existing data from similar studies related to students' satisfaction in online settings. Results from this study have important implications for higher education and the management of a successful online distance education experience for students and teachers alike.

CHAPTER 2

REVIEW OF LITERATURE

History of U.S. Postsecondary Distance Education Learning Strategies

In the United States, distance education has experienced frequent revisions and modifications. Although distance education is over 150 years old, the discipline has undergone dramatic changes (Holmberg, 1986). Earlier forms of course delivery used audio connections, videotapes, radio, and television (Buckland & Dye, 1991; McIsaac & Gunawardena, 1996). The main drawback of radio and television was the inability to interact between teacher and student (Sherry, 1996). Since the 1980s, satellite telecommunications transmitted one-way to off-campus sites. One-way transmissions evolved into two-way audio communication using telephone connections. Microwave-based interactive video was introduced in the late 1980s followed by interactive video due to installation of land-based systems. Compressed or interactive video supported two-way communication with visual and audio connections for interactive connectivity through fiber optics (Meyer, 2002). Although the new technologies signified a marked improvement over earlier forms of distance education, instruction was not that much different from traditional on-campus classes, i.e., transmission equipment had to remain stationary and lessons still occurred at a specific time (Holmberg, 1989). These changes to distance education course delivery signified the prelude to the present configuration of off-campus classrooms.

The trajectory from correspondence study to present-day computer enhanced modes of distance education is easy to trace. Distance education's beginning is associated with

correspondence education, which started in Europe and the United States in the mid 19 century (Belanger & Jordan, 2000; Keegan, 1986, 1996). When the Unites States postal service introduced free delivery service, universities and institutions created correspondence courses for the purpose of instructing students in remote areas (Scott & Sarkees-Wircenski, 1996). The postal system was the mechanism used for delivering course materials signifying the first generation of the evolution of distance education (Taylor, 1995, 2002). A pioneer of distance education, William Rainey Harper, with the University of Chicago was credited for establishing the first college-level courses by mail, thus forming the world's earliest distance education program (Matthews, 1999; Public Broadcasting Service, 2003).

Distance education became a pedagogical concept defined not only by geographic separation of learners and teachers, but also by a range of definitions and varying perspectives based on its relationship with learning and traditional instructional methods (Keegan, 1988). The convergence of production, distribution, computing, and telecommunication technologies in distance education are historically characterized as stages in first, second, third, and fourth generation (Nipper, 1989). Correspondence courses represent the first generation. The second generation is symbolized by the integration of print with various forms of multimedia developed in the late 1960s. In the early 1980s, the third generation benefited from the emergence of communication networks (Passerini & Granger, 2000; Thorpe, 1998). The fourth generation is associated with the emergence of the Internet (Rosenkrans, 2001; Taylor, 1995).

First Generation

Considered the forerunner to online distance education, in the early 1800s, correspondence courses were intended to provide education for individuals unable to attend traditional classrooms. The instructional model was largely based on the traditional information

processing approach. Correspondence education was designed to be self-instructional and material was print-based or tape-recorded and sent to the learner (Holmberg, 1989). The learner in turn sent completed written or taped exercises back to the teacher for assessment. The distinguishing characteristic from conventional education was the separation of teacher and learner and the lack of any face-to-face communication. An attractive feature was that course design was flexible enough to accommodate the frontier settlements of a rapidly growing nation (Keegan, 1986). Instruction was designed to support any type of student regardless of his or her background, interests, or learning ability. Very little consideration was given to a student's readiness to learn. Moreover, the success of the program depended upon the ability of the learner to self-motivate (Watkins & Wright, 1991). Even though written communication was limited with only the instructor and it was slow and less spontaneous, correspondence by mail did allow two-way interaction to some extent.

At the time, university education was restricted to the elite, and allowing widespread access was considered politically controversial. Initial course offerings in correspondence education were considered unimportant and were staffed by poorly trained clerical personnel without sufficient academic credentials. As a result, minimal research existed that supported acceptable instructional methodology (Watkins & Wright, 1991). People with physical disabilities, women prohibited from enrolling in educational institutions accessible to men only, and individuals with jobs during normal school hours benefited the most from correspondence education (Prewitt, 1998).

Ann Ticknor, in 1873, founded the Society to Encourage Studies at Home in Boston, Massachusetts. This was one of the first institutions to offer correspondence instruction to women. Due to Ticknor's endeavors spanning 24 years, 10,000 women were given

unprecedented educational opportunities distinguishing her as the "mother of American correspondence study" (Holmberg, 1986; PBS, 2003, 1800's section; Schlosser & Anderson, 1994). Ticknor's program was representative of initial correspondence course offerings, which were primarily oriented toward providing skills training. Their popularity reflected a growing need for more professional development and skill-based programs (Prewitt, 1998).

Second Generation

The correspondence system progressed to the second generation of distance education with the advent of broadcast radio in the 1920s and pre-recorded television/video materials in the 1940s (Taylor, 1995, 2002). Broadcast radio emerged as a new stimulus to the expansion of distance education (Buckland & Dye, 1991; Prewitt, 1998). Educational institutions owned over 10% of all broadcast radio stations and successfully designed and produced educational programming for millions of learners. Initial educational radio licenses were contracted by the Universities of Wisconsin and Minnesota (McIsaac & Gunawardena, 1996; PBS, 2003, 1900s section). Despite their popularity, Keegan (1986; 1996) did not feel that radio broadcasting used in schools fit within the definition of distance education. Instead, he believed radios should function primarily as technological support for classroom instruction. Even with the attractiveness of instructional radio to universities, only one college-level credit course existed by the year 1940 (PBS, 1900s section; Watkins & Wright, 1991, chap. 1).

Advances in technologies in the 1960s in the United States encouraged the exploration of educational television (ETV) as an alternative method for providing instruction to rural and isolated areas (Buckland & Dye, 1991). The State University of Iowa became the first educational institution to broadcast courses using television in 1926. In 1931, Wisconsin's School of the Air was the first American distance education program that delivered instruction

through mass media technology. Remnants of the original program remain on the air (McIsaac & Gunawardena, 1996). The Corporation for Public Broadcasting, during 1969 in conjunction with AT&T, created the first national public television system, Public Broadcasting Service (Buckland & Dye; PBS, 2003, 1960s section). This allowed the interconnection of 140 television stations and prompted unprecedented distribution of educational and non-commercial programs. Although communication was one-way, students were given considerable control of their own learning. They were able to videotape television broadcasts and view them later on their own time. However, few opportunities for student-initiated questions or interaction between students occurred in this environment. Of greater consequence was the lack of a complete college curriculum. This placed the burden on the learner of having to piece together a course of study from other sources (Watkins & Wright, 1991).

Around this time, in 1964, the Carnegie Corporation funded the University of Wisconsin by its formation of the Articulated Instructional Media (AIM) Project. The project was directed by Dr. Charles Wedemeyer to establish criteria for integrating different communication media into instructional curricula. Dr. Wedemeyer was known for creating the concept of independent study whereby greater responsibility for controlling learning would rest with the student rather than with the teacher (Keegan, 1986, 1996). The purpose of independent study was to give students the ability to learn in an environment of their choosing, to develop self-regulated learning strategies, and to ultimately grow into a mature, educated student (Watkins & Wright, 1991). Instruction would be available any place even if only one student was present. In addition, learning would be the student's responsibility, teachers would be free of administrative duties so more time could be devoted to teaching, and wider choices of courses would be offered (Holmberg, 1989).

By incorporating various types of media formats for subject matter presentations, the AIM project endeavored to determine benefits of independent study to self-directed learners. Student interaction was compared to traditional correspondence course formats in an effort to make a distinction between different modes of instruction (PBS, 2003, 1960s section). This was one of the earlier comparative studies in distance education. Unfortunately, the AIM project suffered setbacks due to lack of control over its faculty and curriculum, insufficient funding problems, and no credible academic recognition or degree offerings to students.

After careful scrutiny and extensive evaluation of the AIM project's difficulties, the British Government established the British Open University in 1969 as a cost effective, completely autonomous institution designed to compensate for deficiencies in the original Wisconsin program (Mason, 2000). The university used the mail delivery system for sending student material. Instructional material was enhanced by incorporating audio and video resources into lessons. Students were tutored individually and in groups over the telephone during evenings and on weekends (Matthews, 1999). In spite of its success, Keegan (1986) issued a caveat regarding the use of "open" in Britain's educational model. He thought the term should imply "open" administration policies or "a special spirit" (p. 24). However, in the context of Britain's "open" university, it meant a rigidly structured program, a narrowly defined curriculum, precise due dates for assignments, and inflexible assessment criteria. For this reason, Keegan felt that the "open" in Open University was more appropriately represented by the word "distant."

Despite its limitations, the Open University has continued to serve as a model establishment for distance education (Prewitt, 1998; Sherry, 1996). Enrollment is currently maintained at 200,000 with a total in excess of two million students to date (PBS, 2003, 1960s section).

Third Generation

Computer conferencing, electronic mail, interactive video, and satellite telecommunications facilitated the separation of student and teacher and provided the impetus for transition to the third generation of distance education (Czubaj, 2001; Passerini & Granger, 2000; Thorpe, 1998). Distance education grew dramatically in the early 1980s because of satellite and cable programming services (Buckland & Dye, 1991). Courses were up linked via a university's satellite system and then broadcasted to other locations (Prewitt, 1998). A primary example was a program developed by Iowa State University that provided teacher training through its Teachers on Television (TOT) satellite services. The TOT program allowed student interns to observe master teachers at work during satellite transmissions of real-time classroom sessions. At the end of the broadcast, students could electronically interact with teachers to discuss lesson objectives and teaching styles. The synthesizing of theory and practice provided students with authentic examples of exemplary teaching methods (Schrum, 1991).

By the development and expansion of reliable long-distance telephone systems and increased access to computers linked to telephone lines, teachers and students were progressively able to communicate via computers. The computer assisted in digital management of information and increased the speed for obtaining and processing information (Belanger & Jordan, 2000). Internet and computer networked communications spawned the creation of the World Wide Web (WWW) by Tim Berners-Lee (Draves, 2001). The University of Phoenix, in 1989, offered the first online degree programs to make use of the Internet's interactive capabilities (PBS, 2003, 1980s section). The ensuing explosive growth of the Internet changed the essential nature of delivering educational content to remote students. Distance learning emerged as the term associated with this alternative form of providing educational material (Neal, 1999).

Fourth Generation: Introduction of the Internet

Due to the introduction of new technologies, fundamental characteristics of the field of distance education are continually changing. According to a report issued by the National Center for Education Statistics (Lewis, Snow, Farris, & Levin, 1999), between 1994-95 and 1997-98 enrollment, course offerings, degree, and certification program numbers doubled in distance education. Predictions are that by 2001, in excess of 15 million adults will be enrolled in higher education programs, and by 2002, almost 84% of four-year colleges will offer distance education courses online (Rosenkrans, 2001). The most significant change is the recognition of the Internet as a method of delivering courses online. No longer are classrooms confined to stationary brick-and-mortar edifices. Instead, instruction can occur anytime or anywhere in the absence of the physical presence of a teacher or students (Meyer, 2002).

The realization of the potential of the Internet did not occur overnight. First networking mechanisms and software configurations had to be developed. Next, higher education had to fight for their share of resources since other areas of the educational community were simultaneously competing, namely K-12, community colleges, and training institutions. By 1999, K-12 education had 63% of classrooms connected to the Internet (Meyer, 2002). In a 1998 study of 280 college students, it was reported that 71.8% owned a computer and 73.6% had Internet access to one (Hanson & Jubeck, 1999). Further exacerbating the situation were personal home users insisting on faster, better computers and even faster, better connections. According to the University of California in Los Angeles (UCLA) Internet Report of 2001, *Surveying the Digital Future* (Cole), 72.3% of Americans were currently using the Internet. In their follow-up Internet Report of 2003 (Cole), 71.1% of Internet users from the 2001 survey had remained online. As a result, higher education experienced a great deal of growing pains trying to catch up

with the proliferation of the WWW as an instructional resource and simultaneously meet the demands of student enrollment in distance education courses (Bonk, 2002; Bork, 1999; Duderstadt, 1997; Hanna, 1998; Meyer). In fact, a report issued by the AFT predicted that the total e-learning market including education and training would reach earnings in excess of $25 billion by 2003 (Kriger, 2001). Such projections indicate distance education will be in position for major growth over the next several years, with the potential to offer more attractive options to traditional teaching methods (Liu, Lavelle, & Andris, 2002; Riva, 2001).

Delivery Methods of Online Distance Education Instruction

Since delivery methods for online distance education are considered relatively new, there is a great deal of confusion about designing courses for this medium and determining which factors influence successful delivery of distance learning. Essentially, online distance education courses delivered through computer networks are categorized as asynchronous or synchronous (Belanger & Jordan, 2000). Asynchronous refers to instruction that occurs anytime or anywhere, whereas synchronous refers to real-time interaction between the instructor and learner. Videotapes, computer-based training (CBT), and web-based training (WBT) occur asynchronously. On the other hand, teleconferencing, chat rooms (“keyboard conversations”), multi-user domain (MUD) sessions (“water coolers of the Internet”), and video tele-training support synchronous communication (Belanger & Jordan; Grabe & Grabe, 2001, p. 197; Lauckner & Lintner, 2001, p. 362).

In asynchronous distance education, instructors rarely see their students and course delivery methods rely primarily on computer technology (Bourne, McMaster, Rieger & Campbell, 1997; Ely, 2001). Given that asynchronous courses are mostly Web-based, chat rooms and threaded discussion groups are used extensively. Contact with the instructor takes place

through electronic mail (e-mail) or fax. This type of indirect contact is referred to as computer-mediated communication (CMC) (Phillips, Santoro, & Kuehn, 1988). This approach is considered a passive form of communication meaning that students have no opportunity to interact with the instructor in real time. Instead, students receive information through some technological means, work at their own pace, respond to simple instructional cues, and seldom converse face-to-face (NEA, 2000a, 2000b). Major advantages to this form of instructional delivery are that students can compensate for poor typing skills and remain in control of their own learning. Asynchronous networks also offer more flexibility in that they are easily adaptive to personal lifestyles and schedule demands. An example of asynchronous instruction is non-interactive computer based learning (CBL; Belanger & Jordan, 2000).

Synchronous learning occurs when students and instructors interact with each other in real time. According to their ability to handle real-time communication, media platforms differ in audio, video, graphics, and text transmissions. Some technologies can handle real-time interactive collaboration by providing electronic whiteboards, shared mouse control, and group support applications (Brem, 2002). The significance of synchronous learning is that feedback from the instructor and other students are immediate, simultaneous, and highly interactive (Davidson-Shivers et al., 2000). However, courses have to occur at a scheduled time. An example of synchronous instruction is desktop videoconferencing (Passerini & Granger, 2000; Rosenkrans, 2001).

Computer aided technology can be used asynchronously or synchronously. Computer-aided instruction (CAI) has multiple terms associated with it: computer-aided learning (CAL), computer-based learning (CBL), computer-based teaching, and computer-aided teaching (Dede & Palumbo, 1991). In CAI, the instructor uses both computers and the WWW for learning. The

WWW is an unlimited source of online tools such as computer games and simulations to supplement lecture-based instruction and provide hands-on training. CAI tools are available in two forms: software programs that center on specific topics or generic software for practicing exercises created by the instructor (Belanger & Jordan, 2000; Grabe & Grabe, 2001; Lauckner & Lintner, 2001).

Instructional Design and Development of Online Distance Education Courses

Technology in online distance education classes may have a more important effect on learners in some situations than others due to individual differences in performance and variations of interaction between task, learner, and technology (Wolfe, 2001). In designing online distance education courses, it is important to consider the different needs of students along with course content and technological factors (Sherry, 1996).

One of the essential requirements in preparing effective course content is interactivity. Interactivity in an online environment imitates the natural way individuals communicate with each other. The idea is to create an authentic learning environment where students feel free to interact with each other (Rosenkrans, 2001). Through computer-mediated communication (CMC), students can effectively communicate and learn collaboratively even though they are widely separated by distance (Jonassen, 2000; Jonassen et al., 1995; G. Moore, 1991; Phillips et al., 1988). In CMC, interaction refers to the virtual dialogue Internet users perform online, e.g., e-mail, chats, and bulletin board discussion groups (Beatty & Bonk, 2001; Phillips et al.).

Another factor in delivering distance education that has elicited an important body of research is visual imagery (Dede & Kremer, 1999; Sherry, 1996). Visual imagery is a component of long-term memory (LTM). With LTM, an individual is capable of storing imagery of different types, e.g., smells, sounds, visual representation, and recalling it several years later (Grabe &

Grabe, 2001; Hirumi, 2002; Norton & Wiburg, 1998). The research on visual imagery is extensive and follows the tenets of brain-based research (Dodwell & Humphrey, 1990; Park, 1998; Richards & Anderson, 2003). A consideration in contemplating the use of imagery is that dependence on exciting visuals may alter the focus of curriculum standards by relying on the entertainment value of events rather than promoting careful analysis of their underlying educational value (Sherry, 1997). However, making information visual is not necessarily enough. Extra pointers and constraints need to be provided to make the relationship more intuitive for the student. In other words, if visuals are not properly connected to sound pedagogical beliefs or if they lack relevance, then the imagery is useless (Dede & Kremer, 1999). Additional research extensively investigates the benefits and deficiencies in using animation and verbal information that accompanies visual displays (Park). Stafford (1997) cautioned, "For many reasons, but especially in light of the computer-driven 'imaging' revolution sweeping across every facet of culture and education, we can no longer afford to see images as the substanceless, yet ironically dangerous, enemy" (para. 3).

Major Issues for Online Distance Education in Higher Education

Professional Development

Initially, novel media and learning technologies are warmly welcomed. Their innovating power for learning and instruction are undisputed. Then, after a period of sporadic use and disappointment about learning outcomes, new learning devices generate a new set of expectations, comparable limited use, and accompanying feelings of frustration. Properly instructing faculty so that they are familiar and comfortable with new technologies is imperative before attentiveness to course content can begin (Kriger, 2001). The emphasis on teacher training is essential in creating or narrowing the gap between course objectives and results.

The growth in distance education has created a demand for faculty to grapple with challenging technological requirements beyond their skill levels. According to Schrum (2000a), UCLA issued an ultimatum that all arts-and-science instructors must construct WWW sites for their classes. York University, in Toronto, made similar demands. Regrettably, the administration completely disregarded faculty input and overlooked provisions for intellectual property protection.

This brings to the forefront the issue whether professional development should be technology driven or pedagogically driven. Many innovative technological projects assume that the teacher is familiar with a computer. Depending upon his or her prior skills and knowledge, this may imply expertise in making the right hardware connections, using a personal computer with compatible software, and several other tasks of comparable complexity (Turoff, 1997). Studies carried out by Fitzgerald, Lovin, and Branch (2003) concluded that, "While searching skills are an issue along with a disparity in technical skills between new and experienced teachers, these problems can be addressed. The future of organized Web-based resources for teaching looks bright" (p. 46). This followed an extensive investigation of over 1,200 teachers and their use of a Web site, *The Gateway to Educational Materials*, developed as an online source for lesson plans and other information for teachers. Clearly, there was a difference between the effectiveness of a learning environment and the effective use of one. As a result, professional development should simultaneously address learning to know how, why, and when to use technology, not only for teachers but also for students (Smith, 1997). Specifications and criteria for sound pedagogical principles also need to be established (Schrum, 2000b).

A survey conducted by Bonk (2002), in conjunction with Indiana University and *CourseShare.com*, indicated that over 80% of the instructors felt that teaching online was more

time-consuming than teaching traditional courses. Forty percent identified the lack of support for handling technical problems and course development as major issues in teaching online courses. Arsham (2002), from the University of Baltimore, maintained that it took twice as much time to teach an online course compared to a traditional one especially with regard to student feedback. He claimed that repetition in providing feedback in an asynchronous environment was more time consuming than in a synchronous one. For instructors, having to field so much text-based content can result in an increase in workload that far exceeds any intrinsic benefits (Hanson & Jubeck, 1999). In a survey carried out by AFT (Kriger, 2001) probing distance learning practitioners, half of the respondents polled received no extra compensation for the additional time necessary to develop an online course. Over 90% of the individuals surveyed found a significance increase in preparation time compared to time spent in developing traditional coursework.

Technological Constraints

During the development phase of a new learning environment, technological constraints absorb increasing amounts of time, financial resources, and manpower. Solving problems during the development phase inevitably puts pressure on faculty. Moreover, choices for technological priorities are limited to stable technological and support infrastructure and cost effectiveness (Arsham, 2002; Schrum, 2000a). If technological components are limited due to constraints and time pressures, the whole purpose of a development project can be at stake. Therefore, a delivery platform must be robust enough to support multimedia (if that is a major element) across different operating systems. The knowledge and expertise should be in place to handle workstations, servers, and video conferencing equipment. The infrastructure to support the equipment must also be reliable, e.g., networks, Internet connections, and phone lines have to be capable of handling transmission loads (Meyer-Peyton, 2000, chap. 7).

Virtual Universities

Globalization has become one of the most fashionable concepts of our time whenever trends and issues of education are discussed. As higher education enters an age of globalization, educational needs and technology are converging to integrate knowledge and people (Spring, 1998). The purpose of integration will be to promote lifelong learning, learning societies composed of knowledge workers, international and national academic standards, and multiculturalism (Stallings, 2000). To meet the needs of a globally acclimated civilization, a majority of individuals will receive their education online in a distance education, virtual learning environment.

Virtual universities can be described as a technological system that allows members of the community to interact within the same instructional knowledge environment. The major components of virtual universities include the structural design and tools specifically intended to support collaborative online learning (Bernard et al., 2000; Riva & Galimberti, 1997). Cyberspace is the term used to describe the virtual environment whereby there "would be a real-time, online, multi-person virtual world in which, through ideas from scientific visualization, cognitive entities would take on tangible, sensory form to facilitate access and manipulation" (Dede & Palumbo, 1991, p. 4). Virtual universities provide an adaptable framework that supports advanced pedagogies based on principles of active learning, collaborative effort, online participation, multiple perspectives, and knowledge construction (Czubaj, 2000; Rosenkrans, 2001; Schutte, 1996; Sherry, 1996). The WWW is the most suitable medium for enhancing collaborative learning by coordinating and organizing it in real time. Hypermedia permits learner control by creating links and connecting different pieces of information (Dede & Palumbo, 1991;

Riva, 2001; Vrasidas, 2002). The attention to pedagogy is a distinguishing factor from other online web-based virtual settings.

Concepts of Distance Education

Definition of Distance Education

It is not necessary to invent new pedagogy for distance education. Rather, it is the same as any type of education given that one of education's primary goals is to transmit knowledge skills (Norton & Wiburg, 1998). In fact, education offers the best platform of concepts for development of the field of distance education and its evolution as a discipline (Adrian, 2000). However, the learning environment, tools, and methods related to it are different. Distance education is education gained through distance learning whereas; distance learning is the process of interaction between student and teacher that is organized with all the components typically used for the educational process (Belanger & Jordan, 2000; Bruce, 1999).

The use of the expression distance learning is problematic since it implies that the learner's actions are separate from the teacher's actions. In essence, every distance-learning program is also a teaching program and as such comprises distance education (S. Wang, 1994). More appropriately, distance education is not merely a geographic separation of learners and teachers. "It is a distance of understandings and perceptions, caused in part by the geographic distance, that has to be overcome by teachers, learners, and educational organizations if effective, deliberate, planned learning is to occur" (M. Moore, 1991, para. 4). It is also "that subset of educational programs in which the separation of teacher and learner is so significant that it affects their behaviors in major ways, and requires the use of special techniques, and leads to special conceptualization" (para. 6). Unfortunately, disagreement exists about the definition of some of the concepts of distance education and more awareness on the correct use of

terminology is needed. Other terms that have been applied to the field are correspondence study, home study, external studies, independent study, teaching at a distance, off campus study, and open learning (Keegan, 1986, 1996).

There are countless contributors to the development of theoretical approaches to distance education. According to Schlosser and Anderson's (1994) review of the literature, some of the early theoreticians to the field included John Bääth (1979), Manfred Delling (1971), Michael Moore (1973, 1977), Hilary Perraton (1981), Otto Peters (1973, 1983), David Stewart (1981), Kevin Smith (1983), Charles Wedemeyer (1981), Desmond Keegan (1983), and Börje Holmberg (1986).

Notably, Keegan's (1986) work delineated three major concepts in the development of distance education theory. The first one, advanced by Wedemeyer and M. Moore, created the initial theoretical structures pertaining to learner autonomy and independence in the 1960s and 1970s. The second concept evolved in the 1970s from Peters of the German Institute for Distance Education. Peters was recognized for characterizing distance education as an industrialized form of teaching and learning. Finally, Bååth, Holmberg, Daniel, Stewart, and K. Smith were credited for developing the third major concept during the 1980s, which synthesized theories of interaction and communication.

Keegan (1986), in his attempt to come up with a definitive concept of distance education, identified the following essential elements:

1. Distance education is a logical and separate field of education that provides programs of study at a distance at primary, secondary, technical, college, and university levels for public and private institutions.

2. Distance education has existed over 100 years and is present in most countries.

3. Distance education is a "quasi-permanent separation of teacher and learner throughout the length of the learning process." (p. 49)

4. Distance education teaches students individually; students are not taught in groups.

5. Distance education uses technical media to facilitate instruction between the teacher and learner.

6. Distance education is a complete educational program with its own didactic structure and administrative procedures.

Holmberg (1989), in developing his theories of interaction and communication, expressed his theoretical approach to distance education by stating:

> Distance education is a concept that covers the learning-teaching activities in the cognitive and/or psycho-motor and affective domains of an individual learner and a supporting organization. It is characterized by non-contiguous communication and can be carried out anywhere and at any time, which makes it attractive to adults with professional and social commitments. (p. 168)

Communication

In online distance education, two-way communication is an essential form of interaction and dialogue (Arbaugh, 2001; S. Wang, 1994). Teaching and learning behaviors are executed apart from each other, thereby necessitating the use of electronic and mechanical devices to facilitate communication (Moore, 1973). Garrison and Shale (1987) defined two-way communication as the "simulated structured interaction with sophisticated microprocessor-based course-ware, as well as the informal network of human contacts to which the independent adult learner typically appeals" (p. 12). It is the electronic equivalent of passing notes to one another through bulletin board discussions, chat rooms, and e-mail. Communication is a reciprocal

process where students and teachers share their understandings and engage in meaningful narratives that enable knowledge creation (Riva, 2001). For that reason, requiring communication between teacher and student is a necessary element, and its inclusion precludes distance education from limiting itself to merely reading text or watching a television broadcast (Thorpe, 1998).

Learner Autonomy

Another important concept relative to distance education is learner autonomy. Autonomy is represented by the degree a learner in an educational program is able to determine the selection of resources and materials (Holmberg, 1989). In traditional classroom settings, learners are dependent on teachers for guidance. In most programs, the teacher assumes an active role and the students a passive one. However, in distance education, the autonomous learner needs little assistance from the teacher and as a result; the teacher assumes more of a facilitator's role rather than a director's (Anderson, Rourke, Garrison, & Archer, 2001; R. Gagne, 1985; R. Gagne et al., 1988). M. Moore (1973) stated, "Learner autonomy is heightened by distance. Indeed, the learner is compelled by distance to assume a degree of autonomy that he might find uncomfortable in other circumstances" (p. 670). Moore felt this type of learner was "turned on" to material that satisfied his or her goals and "turned off" if it did not. Due to the limitations imposed by transactional distance in online distance education programs, learners must take responsibility for the conduct of their learning and become skilled at independence and self-directedness (Keirns, 1999; Liu & Ginther, 1999).

Detractors of the concept of learner autonomy feel that many students who have just graduated from high school are not prepared to be self-directed and still require significant and timely feedback on their performance. They maintain that allowing the learner complete control

does not work in actual practice; however, learner control used with advisement can be a productive compromise (Grabe & Grabe, 2001).

Learner-Centeredness

Believing online distance education is its own mode of education and that it requires an individualistic or a learner-centered perspective, its primary objectives remain the same as instructional objectives formulated for a traditional classroom. As such, what determines whether a course is good or bad is its design criteria and delivery method, not whether instruction occurs in the classroom or at a distance. Online distance education revolves around a learner-centered approach (Passerini & Granger, 2000). This approach articulates the belief that education is about learning. Learner-centeredness is characterized by the degree of control the learner has over his or her learning experience (Boulton, 2002; Strickland, 1989). That degree of control is contingent upon whether learners' are internally or externally motivated. Learners with internal locus of control perceive their academic achievement is contingent upon their behavior. In contrast, learners with external locus of control perceive events occurring because of luck or powers beyond their control (Bandura, 1986; Rotter, 1966, 1990). As a consequence of its prominence in cognitive aspects of behavior, locus of control or internal/external control of reinforcement is considered one of the most frequently studied variables in psychology (Bandura; Rotter; Strickland).

In learner-centered classrooms, learners determine what is learned, how it is learned, and how learning outcome is measured (Dede, 1996). The learner-centered model places the student in the center of the learning process. Rather, the students are the determinants of how successful learning will take place. It is the student's responsibility to initiate his or her own learning (Denning, 1996; R. Gagne, 1986; R. Gagne et al., 1988). Online distance education sustains the

learner-centered model in that individual students' needs are addressed, study times are flexible, and face-to-face participation is not required. Since students are isolated from the teaching-learning community and may experience uncertainties about completing coursework within the imposed time constraints, the learner-centered model is conducive to providing distance learners with adequate motivation and addressing their needs (Keller, 1999; Visser, Plomp, Amirault, & Kuiper, 2002). In order to gain greater control over their own learning, self-efficacy and self-discipline become significant factors in students' success or failure in online distance education settings.

Collaborative or Group Learning

Collaborative or group learning is based upon a learner-centered model that considers learners as active participants (Kaye, 1992; Tam, 2000). Collaborative learning is the design of learning opportunities in which students with varying levels of expertise help each other accomplish a common goal (Norton & Wiburg, 1998). In an online distance education environment, students experience problems with feelings of isolation, procrastination, absence of two-way communication, and difficulties with self-regulation of learning because of the autonomy that is inherent in distance education settings. The introduction of collaborative online learning (COL) encourages active, constructive learning and critical thinking, whereby students are encouraged or required to work together on academic tasks (Bernard et al., 2000). In promoting COL, learners are not just passive recipients of knowledge. Instead, students receive knowledge and skills from outside sources and build knowledge based upon online conversations, sharing different viewpoints, and resolving disagreements (Haythornthwaite, Kazmer, & Robins, 2000).

Theories of Online Distance Education

The Search for a Theory

Literature in the field of distance education reveals that the research and theoretical foundations are incomplete. Distance education is still struggling to identify suitable theoretical framework that recognizes issues related to the learner, the teacher, and the technology. M. Moore (1993) exhibited his frustration in conceptualizing distance education when he stated, " American distance education remains a highly heterogeneous business . . . the situation remains chaotic and confused. There is no national policy, nor anything approaching a consensus among educators of the value, the methodology, or even the concept of distance education" (para. 6).

Holmberg's Theory of Guided Didactic Conversation

Holmberg's (1986) theory of distance education was derived from several assumptions regarding "the actual exchange of questions, answers, and arguments in mediated communication" (p. 123). Holmberg asserted, "Distance teaching will support student motivation, promote learning pleasure and effectiveness if offered in a way felt to make the study relevant to the individual learner and his/her needs, creating feelings of rapport between the learner and the distance-education institution" (p. 123). Didactic conversation between the teacher and learner can be beneficial without face-to-face communication as long as it "stimulates activity and implies reasoning, discussing for and against, referring to the student's previous experience and thus avoiding omissions in chains of thought" (Holmberg, 1989, p.28). Communication in online settings is a key factor and is essential in establishing a functional relationship between instruction and expected learning outcomes.

Moore's Theory of Transactional Distance

M. Moore's (1991) précis of theory was, "the summary and synthesis of what is known about a field. It is the reduction of our knowledge to the basic ideas, presented in a way that shows their underlying patterns and relationships" (para. 3). In initially articulating his theory, Moore (1973) defined distance teaching as follows:

> Distance teaching may be defined as the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronics, mechanical or other devices. (p. 664)

His definition focused on the types of learning and teaching that occurred in situations outside the traditional classroom where learning took place without any social contact with an instructor.

At some point in a distant learning situation, the physical gap between the learner and teacher is somehow bridged and the learner successfully performs tasks associated with learning. In the early stages of theory formation, M. Moore (1973) elaborated on the importance of dialogue and individualization in minimizing transactional distance between teacher and student. Moore referred to dialogue as the "extent to which a learner may communicate with his teacher" (p. 665). Regarding individualization, Moore characterized it as "the extent to which a learner can control the pace at which he receives information and at which he must make his responses" (p. 665). Moore elaborated further, "The existence of the gap means the behaviors of teachers, and of learners, will be influenced by it, and so a theory of independent learning-teaching must take account of that influence" (p. 666). For that reason, teaching and learning behaviors in an

online distance education setting have to accommodate transactional distance by encouraging participation and monitoring students' abilities to handle their own learning.

The foundation of M. Moore's theory is derived from Dewey's concept of transaction (Dewey & Bentley, 1949; Ratner & Altman, 1964). It was Dewey's contention that cognition was no longer a measure of reality but represented only one of the many possible methods of individuals' transactions with their environment where a dynamic interdependence existed between the two. As such, in a distance learning environment, the teacher, content, environment, and student are all involved in the learning experience (Berge & Collins, 1995). Learners will modify their behavior by interacting with others directly because of the transactional distance between them. These special behaviors are necessary particularly in text-based environments in online distance education, since students and teachers cannot interact in a face-to-face context. Ultimately, students will need to become active participants in their online learning community in order to facilitate their learning in an electronic environment (Lally & Barrett, 1999; Zimmerman, 1989).

Constructivism

Constructivism allows students to explore and create their own meanings. Vygotsky (1978) laid the foundation for constructivism by maintaining that learning actually occurred when individuals tried to make sense of the world around them. In Vygotsky's words, the learner needed to navigate the Zone of Proximal Development, i.e., "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance. . ." (p. 88). Crotty (1998) characterized constructivism as a meaning-making activity of the mind that involved an individual's way of making sense of the world. Crotty felt that learning should not be considered

a passive activity. In order to learn, the learner must experience concepts and socially negotiate meaning in the context of his or her learning environment.

In keeping with constructivists' concepts that learners create knowledge through their prior experiences and beliefs, the purpose in the design of instruction should be to provide an environment in which individual learners can effectively build on what they know. At the same time, they should have the resources and assistance to actively learn. With the use of technology, particularly with the WWW, self-guided exploration and knowledge construction facilitates the learning process (Debowski et al., 2001). The technology used in online distance education can support the constructivist approach by making sure it promotes learning with meaningful tasks, encouraging scaffolding by helping students develop the skills needed to complete a task for their selves, and gradually increasing the complexity of tasks (Grabe & Grabe, 2001; Norton & Wiburg, 1998; Reiser, 2001; Vygotsky, 1978).

For Dewey (1916), constructivism meant that knowledge and ideas emerged in a social context where students were joined in manipulating materials to create a community of learners who built their knowledge together. Social interaction enables learners to discern contributions made by others. These contributions are anticipated, cross-referenced, and acted upon. When acted upon, this facilitates a common understanding among learners and generates more knowledge construction.

On the other hand, Piaget (1985) interpreted learning as a process of developmentary steps, whereby cognitive structures were continually assimilated and accommodated. These intricate cycles of assimilation and accommodation eventually result in knowledge construction. Knowledge is built through experience; through experience, schemas or mental models are created (Senge, 1990). What follows is a hierarchy of regulations, each one enhanced by the one

before, leading to self-regulation, which finally culminates in a higher degree of integration. However, Ornstein and Hunkins (1998) issued this caveat, “Piaget’s work should still be considered theoretical, still open to question, and not fact to be followed blindly in developing and teaching the curriculum” (p. 111).

Online distance education provides the type of environment that promotes constructivist principles where learners are expected to be self-regulated, interactive, and collaborative participants in their learning experience. Constructivist experiences in an online distance education setting afford students the ability to apply the ideas they have assimilated in aiding their comprehension and metacognitive abilities. Students become motivated to master concepts and skills, since they can perceive the connection of what they are learning to current mental models (Dede & Kremer, 1999). Senge (1990) identified mental models as deeply ingrained assumptions that appeared in the form of pictures or images and influenced how individuals understood the world. Learners have the ability to control external influences through the five disciplines of systems thinking, personal mastery, mental models, building shared vision, and team learning.

Social Cognitive Theory

Bandura (1989) defined social cognitive theory as a model of causation that involved triadic reciprocal determinism. In developing his theory’s concepts, Bandura (1986) stated the following:

> People are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other. (p. 18)

Bandura's first book publication in 1959 was during the period when behavioral forces strongly influenced psychology (Grusec, 1992). He opposed the behavioral focus on the operation of social forces and broadened its application to include a distinction between learning and performance. Bandura's theory of social development served as a bridge between behaviorism and cognitive psychology.

In social cognitive theory, behavioral development and socialization is partly influenced by the environment (Bandura, 1989). Cognitive development is more complex than changes in thinking that occurs sequentially from one stage to another as in Piagetian theory (Piaget, 1985). According to social cognitive theory, thinking is principally influenced by social factors. Bandura stated, "Maturational factors and the information gained from exploratory experiences contribute to cognitive growth. However, most valuable knowledge is imparted socially" (p. 12).

Vicarious experiences are additional factors central to social cognitive theory. Direct experience is not the only issue to influence acquisition of knowledge and skills. Through exposure to peers' learning experiences, vicarious learning suggests that educational benefits can indirectly occur and students will be motivated to learn. Seeing others rewarded or punished causes observers to insinuate that they will experience similar outcomes (Miltiadou & Savenye, 2003). On the other hand, if students have doubts about their ability to perform adequately, their expectations for success will not be incentive enough to continue to persist. The disinclination to persist does not mean that learning has not occurred. It merely signifies that the tendency to imitate or model the observed behavior in other situations will decline (Schunk & Zimmerman, 1997; Zimmerman & Kitsantas, 1999). Bandura (1989) elaborated, "A culture could never transmit its language, mores, social practices, and requisite competencies if they had to be shaped tediously in each new member by response consequences without the benefit of models

to exemplify the cultural patterns" (p. 21). In online distance education, without the direct interaction between learners and teachers, vicarious learning is difficult to provide. However, there are methods whereby vicarious resources can be captured from different types of dialogue. By providing previous courses' discussions and annotated examples of others' work, resources can be built to provide learners a wider perspective of learning outcomes (Stenning, McKendree, Lee, & Cox, 1999).

Central to Bandura's social cognitive theory are self-efficacy and self-regulated learning. Bandura (1986) emphasized the importance of these behaviors when he said, "Among the different aspects of self-knowledge, perhaps none is more influential in people's everyday lives than conceptions of their personal efficacy" (p. 390). In relation to self-regulation, Bandura (1989) maintained, "The capacity to exercise self-influence by personal challenge and evaluative reaction to one's own attainments provides a major cognitive mechanism of motivation and self-directedness" (p. 47).

Self-Efficacy

In online distance education, where students and teachers are geographically separated, it is important for students to be self-directed and self-efficacious for them to be satisfied with their learning experience. Self-efficacy, according to Bandura (1994), is presented as follows:

> Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves, and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes. (para. 1)

In other words, what students expect of themselves is strategic in self-efficacy theory. Self-efficacy influences initial attempts as well as persistence at performance of specific tasks. Bandura's research indicates that self-efficacy is a prominent factor in students' motivation for performing difficult tasks and persisting even in the event of failure (Corno & Mandinach, 1983). It also influences their choice of task and regulation of effort in behaviors related to achievement (Schunk & Zimmerman, 1997). Self-efficacious students choose to take on tasks that require effort and will continue to persist by overcoming any obstacles that may impede their success (Zimmerman, 1995). Compared to students who question or doubt their learning abilities, students with high self-efficacy participate more readily, work harder, and persist longer. They will persevere and strengthen their effort when confronting difficult situations (Bandura, 1993). For these reasons, high self-efficacy is expected to promote stronger academic performance (Lent, Hackett, & Brown, 1999; Pajares, 1996). There are exceptions, however, in that high levels of self-efficacy will not necessarily produce proficient performances when essential knowledge and skills might be lacking (Zimmerman, 1989).

An effectual assessment of self-efficacy should evaluate specific skills and tailor evaluations to the precise psychological domain being explored (Bandura, 1986). Self-efficacy can differ in level, strength, and generality. As a result, in comparative studies, self-efficacy must be measured under appropriate circumstances. If comprehensive measures are ill defined, results will be disparate, erroneous, and assessments will be inaccurate. Bandura maintained there was a great deal of inconsistency in performance of sub skills in different activities. The same activity may involve different abilities when presented with different situations.

Passage of time is another important aspect of self-efficacy assessment. Students with weaker perceptions of self-efficacy are easily influenced by new information. Even individuals

with powerful percepts of self-efficacy will change if their experiences are adverse or unsatisfactory (Bandura, 1986). The best measurement of self-efficacy occurs if it is in close proximity to the actions that create the relationship. If too many experiences intervene, judgments become dated, and "artifactual discordances if people are acting on altered self-percepts" are created (p. 396). Bandura emphasizes that it is not the amount of time but the strength of experiences that can adversely or inappropriately effect outcome measures.

Self-efficacy can influence students' choices about approaches to learning new or unfamiliar tasks, the intensity of effort that is applied to a task, and the degree of persistence that is directed toward a task (Schunk & Zimmerman, 1997). These learning processes are referred to by Schunk as efficacy cues and are important in promoting self-efficacy. Efficacy cues are further influenced by the aptitudes, personality characteristics, and prior experiences that students bring to a learning task.

Past experiences with a task have also proven to affect an individual's physiological and affective state. The similarity of a task to one already experienced by an individual will influence self-efficacy beliefs. Success with prior tasks will enhance self-efficacy beliefs whereas failure can greatly diminish students' perceptions of their efficacy (Bandura, 1997). It is important to note, however, success or failure is not the sole determinant of individuals' perceived self-efficacy. All of the various aspects of self-efficacy beliefs interact with one another and play an important role in every student's undertaking.

In a review of the research literature on measures of self-efficacy, Vispoel and Chen (1990) were not able to identify any one instrument suitable for all studies. In fact, they revealed several shortcomings in existing instruments. They determined the scales that were developed were unsuitable, normative data was insufficient, and test reliability and validity was limited or

nonexistent. Therefore, they recommended researchers should continue their endeavors to develop adequate and appropriate measures for evaluating self-efficacy.

A review of the literature revealed no specific instruments for measuring online students' perceptions of self-efficacy with Web-based tools in distance education. Chang (2000) developed an Online Course Computer Technology Survey (OCTS), which was a modification of Delcourt and Kinzie's (1993) Computer Technology Survey (CTS). Chang's sample was comprised of 40 participants varying from administrators to graduate students. Results were inconclusive. In the earlier study by Delcourt and Kinzie, two other instruments were developed: Attitudes Toward Computer Technologies (ACT) and Self-efficacy with Computer Technologies (SCT). They tested 328 university students enrolled in education courses. Results of regression analysis indicated that experience with computer technologies was a strong predictor of attitudes and self-efficacy. Measures of computer technology included general computer skills such as familiarity with multimedia presentations, creating audio and video files, troubleshooting computer hardware including memory, and peripheral devices. T. Hill, Smith, and Mann (1987) conducted two studies investigating the relation between sense of efficacy regarding computers and students' readiness to use them. A questionnaire completed by 304 undergraduate students in the first study, indicated that computer efficacy beliefs were significant in the prediction of participants' behavioral intentions. In the second study of 133 undergraduate women, their questionnaire produced similar results. These studies indicated the importance of efficacy beliefs in students' decision to adopt new skills related to computer technology.

Self-Regulated Learning Strategies

Zimmerman (1989) explained self-regulation as follows:

> In general, students can be described as self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process. Such students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction. . . . This definition assumes the important of three elements: students' self-regulated learning strategies, self-efficacy perceptions of performance skill, and commitment to academic goals. (para. 2)

The use of self-regulation is given a significant position in academic achievement and is considered vital for learning (Schunk & Zimmerman, 1997; Winne, 1995b). Winne (1995a) considered it inherent to the learning process. Academic self-regulation requires time management, attention and concentration on instruction, organizing and rehearsing information, creation of a productive environment for study, and effective use of social resources (Schunk, 1990; Schunk & Zimmerman, 1997). Some researchers consider self-regulation task specific because in certain instructional environments learners will regulate their own learning, whereas they may not effectively in others (McKeachie, 1995; Pintrich & De Groot, 1990).

For Bandura (1986), individuals' self-regulated behavior was responsible for shaping their environment. In turn, their environment shaped their standards and directly affected their actions. Thus, self-regulation replaced external behavioral controls with internal ones. Bandura elaborated, "The internal standards by which behavior is evaluated do not emerge in a vacuum. They are established by precept, social evaluation, and modeling" (p. 369). This system of self-regulation mediates the control students have over their academic capabilities. As students'

confidence in their perception of their academic achievement increases, so does their confidence and satisfaction in their self-regulated learning strategies (Pajares, 2002).

Social cognitive theorists view self-regulation as composed of three sub processes: self-observation, self-judgment, and self-reaction (Bandura, 1986; Schunk, 1990; Zimmerman, 1989). Self-observation refers to purposeful attention to individual behavior, which provides that person with perceptions of his or her progress. Self-judgment occurs when current performance is compared to a set standard. With self-reaction, responses are evaluated and judged according to an individual's performance standards. If progress toward a goal is acceptable, self-efficacy is enhanced and motivation is sustained. However, negative evaluations do not necessarily result in decreased motivation, particularly if students believe they are capable of improving. Self-reaction is influenced by tangible self-rewards provided they are linked to actual accomplishments. Supposedly all of these sub processes interact reciprocally and are an important factor in academic performance.

While self-efficacy is considered a major personal influence on behavior, the sub processes of self-regulated learning are considered key performance-related influences as well. Again, this goes back to triadic reciprocal determinism where personal, behavioral, and environmental influences are interdependent. Personal influences on self-regulation include goal setting, self-efficacy, metacognition, strategy knowledge, and perceptions of value. Behavior influences consist of efforts at self-observation, self-evaluation, and self-reaction to previous performance. Environmental influences incorporate features of the classroom, planning aids, place of study, and quiet surroundings (Bandura, 1989; Pintrich & De Groot, 1990; Zimmerman, 1989). Such internal standards serve to regulate behavior and result in favorable self-evaluation that, in the end, produces a desired reaction. As Bandura (1986) claimed, "After personal

standards have been adopted, discrepancies between a performance and the standard against which it is measured activate evaluative self-reactions, which serve to influence subsequent behavior" (p. 20).

In order to optimize students' learning, the selective use of specific regulatory behaviors ought to be adapted to each learning task. According to Zimmerman (2002), such behaviors included: (a) setting proximal goals, (b) adopting strategies for attaining goals, (c) self-monitoring progress, (d) regulating goal compatibility, (e) efficient time management, (f) self-evaluation, (g) acknowledging cause of results, and (g) adaptation. Through the effective assimilation of these processes, students are able to create an environment that optimizes their learning experiences.

Due to the transactional distance imposed by online distance education instruction, students are expected to actively search for and sort through information on their own. While learners are isolated, individual attempts to make sense of complicated data or information can lead to failure (Dede & Kremer, 1999). Students may have little or no opportunity to interact or communicate simultaneously. This can result in delays between feedback and evaluations from the instructor. The possibility can then occur where a student will incorporate incorrect learning into the next task. Such an incident can override any intercession on the part of the instructor to remedy effectively the situation (Van Kekerix & Andrews, 1991). Therefore, it is essential that teachers have a complete concept of students' self-regulatory skills (Eshell & Kohavi, 2003). Understanding and encouraging individuals' self-regulatory processes can foster a successful and satisfactory learning experience for both online distance education students and teachers alike.

Participation

The presence of a physical classroom in the traditional sense does not necessarily guarantee a community any more than the presence of a chat room in an online distance education course. The important factors in the formation of a learning community are students who assume responsibility for their own learning and who provide a reason for their learning in social contexts. According to benchmarks developed for the Institute for Higher Education Policy (IHEP; Phipps & Merisotis, 2000), participation is considered essential for students' success in an online course. In order for students to participate effectively, they must have the ability to interact with each other and their teacher using Web-course tools such as, electronic bulletin boards, discussion boards, electronic mail, or synchronous chat rooms (Picciano, 2002). They must also be able to share ideas, reflect reciprocally on their experiences, and form partnerships with fellow students. In fact, with respect to students' perceptions of learning and satisfaction, a course's success is largely dependent upon the type of interaction that occurs in an online community (Fredericksen et al., 1999; Gunawardena & Zittle, 1997; Richardson & Swan, 2003).

Moore (1989) described three types of interaction present in online distance education classes: learner-to-content, learner-to-learner, and learn-to-instructor. Learner-to-instructor interaction promotes motivation, feedback, and support between the student and teacher, e.g., e-mailing or chatting with the instructor in real-time. Interaction between learner-to-content provides scholarly information and advances learners' understanding of course content, e.g., taking an online quiz. Learner-to-learner interaction is the exchange of information, ideas, and dialog between students, e.g., accessing electronic bulletin boards to discuss issues pertaining to the course (Arbaugh, 2000, 2001; Huang, 2002). However, Hillman, Willis, and Gunawardena

(1994) observed another form of interaction emerging in online settings resulting from the interface of learners with technologies for instructional delivery. They identified this interaction as learner-to-interface and emphasized its significance in facilitating students' acquisition of skills for effective participation in an online environment.

Analysis of interaction patterns in online conferences attempts to determine whether actual characteristics of the media are factors in communication differences or whether its students' perceptions of media. It is unclear how CMC affects students. However, some studies indicate that students with high overall perceptions of participation score high in perceived learning and satisfaction (Fredericksen et al., 1999; Jung, Choi, Lim, & Leem, 2002; Richardson & Swan, 2003).

In traditional place-based education, communication is generally one-to-many or one-to-one. Online distance education courses, on the other hand, are mainly based upon collaborative learning models with many-to-many communications. The distinguishing feature from previous generations of distance education is that learning processes are now primarily social rather than individual (Benigno & Trentin, 2000; McLoughlin & Luca, 2002). Students' participation in a Web-based learning environment has become a learning experience that encourages effective interaction between learner and teacher (Arsham, 2002; Dede & Kremer, 1999; McDonald, 2002). Sharing, analyzing, and applying information through the exchange of ideas on bulletin boards, e-mails, and chat sessions fosters and promotes understanding (Bullen, 1998).

Much of the research concerning students' participation in online bulletin board discussions has focused on qualitative or descriptive studies (Davidson-Shivers et al., 2000; Hillman, 1997; Rosenkrans, 2001). Before 1992, case study methodologies, interviews, and surveys were primarily used to evaluate learning and participation in online distance education

courses (Heckman & Annabi, 2003). Richardson and Swan (2003) surveyed 97 students enrolled in online college courses at a state college. The study found that students with high overall perceptions of their social presence received high scores on perceived learning and satisfaction. Another study conducted at Pepperdine University measured students' satisfaction and perception with their online learning experience (Rosenkrans, 2001). Ninety percent of the 34 students tested indicated they had a positive experience with the online segment of their course. Gunawardena and Zittle (1997) measured 50 graduate students' perceptions of presence as a predictor of satisfaction in a survey study. Their study demonstrated that the use of emoticons and social presence were a positive factor in students' perception of their online experience. Suny University of New York (SUNY) Learning Network (SLN) (Fredericksen et al., 1999), in its online instructional program created for nearly 64 colleges and almost 400,000 students, reported that in a survey of 1,400 students, interaction with the instructor was the most significant contributor to perceived learning.

Since the level of online participation is critical to instructional activity, accurately determining participation levels can be overwhelming because of potentially large numbers of messages in bulletin board discussions and chat sessions (Rosenkrans, 2001). As the majority of online communication is text-based, analysis is more cumbersome and time consuming than with face-to-face exchanges (McDonald, 2002). In addition, the personality online traits of some students can be confusing. At one end of the continuum are students who log on frequently and dominate interaction on bulletin board discussions. At the other end are lurkers who only want to read others' communication and not directly participate. In the middle lies the moderate with average levels of online participation (Thorpe, 1998). Thus, judging the quantity and quality of interaction in online discussions can be complicated (McAdoo, 2000).

Research indicates that to assess accurately discussions in online courses and to identify additional characteristics of a learner's profile, a detailed content analysis is needed (Henri, 1992). Content analysis requires researchers to sift through large volumes of text in a systematic fashion (Stemler, 2001). Qualitative content analysis is an orderly method of examining symbols of communication, i.e., text, by assigning numeric values to communication (Aviv, 2000). First, discussions are divided into units of analysis. Units of analysis represent a discrete element of text. Syntactical units are indicated by a sentence. A thematic unit is a single thought or idea extracted from a portion of the transcript. A hybrid of thematic and syntactical is considered by some researchers to be the most appropriate (Rourke, Anderson, Garrison, & Archer, 1999). Next, categories and indicators for analyzing transcripts are developed. Examples of categories are behavioral (e.g., expressing emotions) or social (e.g., teacher presence). After indicators are identified, they must be coded (Aviv; Rourke et al., 1999; Rourke, Anderson, Garrison, & Archer, 2000). Coding involves the identification of elementary information units associated with each input from each participant in online discussions. After all discussion elements have been identified and coded, frequencies of similarly coded items are calculated. Hopefully, the end result provides a meaningful tool for educators in understanding the mental processes involved in CMC (Henri). However, major drawbacks to identifying indicators are unit of analysis and interrater reliability. Coding can be subjective and the methodology difficult to validate. Presently, there are no definitive units of analysis in CMC educational literature (Rourke et al., 2000).

Developing the tools for systematically analyzing discussions in online environments has been inconclusive. A Transcript Analysis Tool (TAT) was used for a study of 13 students enrolled in an online distance education graduate-level course (Fahy et al., 2001). The units of

analysis were five categories of sentences: (a) questions, (b) statements, (c) reflections, (d) engaging comments, and (e) quotes/citations. Along with categorizing syntactical units, density was measured to determine the actual number of interactions observed in relation to the number of participants. Hillman (1997) analyzed over 52,000 sentences using computer software to examine language patterns in a computer-mediated communication's (CMC) course. Heckman and Annabi (2003) performed a content analysis of students in a traditional face-to-face class and an asynchronous online distance education class. They categorized responses according to discourse, social, teaching, and cognitive processes. Edelstein and Edwards (2002) developed a rubric to assess the effectiveness of students' participation in threaded discussion. Pilkington, Bennett, and Vaughan (2000) attempted something similar; however, of their instruments neither ones were tested for validity or reliability.

Quantitative methods of analyzing levels of participation focus on calculating the number of interactions observed in online discussions in order to determine social presence (Rourke et al., 1999). Social presence is considered an indicator of interactivity in an online environment. Examining the depth and persistence of threaded discussions determines the level of activity of students' participation (Edelstein & Edwards, 2002; Fahy et al., 2001). Threaded discussion refers to the sequence of messages on a specific topic. A thread is created when a user replies to a previous message. A reply retains the header from the previous message allowing all related discussions to be grouped by a distinct header (Grabe & Grabe, 2001; Miltiadou & Savenye, 2003). Using the 'reply' feature to post messages and directly referring to the content of others' messages are all types of interactive responses in CMC (Rourke et al.).

Prior Computer Experience

Previous studies have revealed that prior computer experience is a strong indicator of students' attitudes toward computer and Internet usage and their level of participation in online discussions (Arbaugh, 2000; Huang, 2002). As a result of their familiarity with computers, students tend to be more satisfied with their online experience, they take more responsibility for their learning, and their learning is enhanced (Richardson & Swan, 2003). In a Web-based course, students' technical proficiency results in frequent visits to a course's Web site and more time spent on the site.

Unfamiliarity with technology can adversely affect students' self-efficacy beliefs. As Bandura (1997) suggested, a student's previous experience with a particular task is often the most powerful predictor of self-efficacy. The successful delivery of instruction and use of online methods is dependent on network technologies. Since, computer-mediated communication (CMC) technologies use e-mail, chat, bulletin boards, and other Web-based tools for instruction, determining students' computer skills and prior computer experience is essential for ensuring their satisfactory experience and high academic performance (Chen, 2002; Harasim, 1999; Joo, Bong, & Choi, 2000; Osika & Sharp, 2002).

Gender

In their self-efficacy to use self-regulated learning strategies, there is equal confidence in abilities between males and females (Pajares, 2002). However, in using self-regulated learning strategies, females are more goals oriented and self-monitor their progress more often than males. Females also exhibit stronger metacognitive strategies. They possess effective effort management and regulate their environment for more optimal learning (Zimmerman & Martinez-Pons, 1990).

Not only are there differences in the confidence levels between males and females, gender differences exist in responses to self-report questionnaires. Males tend to be more self-congratulatory, whereas females are more self-effacing. That is, males tend to express more confidence in skills they do not have and overstate their confidence in skills they do have (Pajares, 2002).

The stereotypic beliefs of males and females in American society greatly influence gender identity. Depending upon how strongly an individual identifies with the characteristics typically associated with their gender determines how they will perform (Bandura, 1989). For example, if males perceive writing as an effeminate trait, they will be less efficacious toward exhibiting confidence in that skill. Home, education, and culture are also major influences in contributing to gender differences. Parents have lower expectations for their daughters and generally underestimate their academic abilities. Likewise, media reinforces traditional gender roles by portraying men as authority figures and females as subservient (Pajares, 2002). Bandura stated, “Sex typing is promoted through a vast system of socialization practices beginning at birth with infants clothed in pink or blue apparel depending on their sex.” (p. 33). By observing social examples, individual gender role development occurs.

Comparative Research of Effectiveness of Distance Education

Early Comparative Studies

Since education at a distance has been practiced on university campuses starting from the 1950s, comparative research examining the effects of distance education and traditional face-to-face instruction has been going on for quite some time (G. Brown & Wack, 1999; Diaz, 2000; McDonald, 2002; Saba, 1998; Tucker, 2001). Therefore, to evaluate effectively current research regarding online distance education and its relative benefits, it may be useful to look at some of

the prior research with respect to other distance education technologies and how it has fared compared to traditional classrooms. In a review of several studies performed on distance education, Moore and Thompson (1990) determined that conclusions drawn about the effective use of interactive technologies were primarily composed of case studies, opinions, and advice. They cited a 1987 report prepared by Eiserman and Williams whereby 503 documents relating to distance education pertained to program descriptions and problems encountered in higher education. Of these documents only 46 addressed technologies. Out of the 46 that related to the use of distance education, "twenty-two were position papers, seven described instructional materials, three pertained to technical components, five were reviews of research, and nine were primary research studies. . . . These last fourteen articles provided little or no empirical evidence to support claims of general effectiveness" (p. 8).

M. Moore and Thompson (1990) provided a comprehensive chronology of early comparative studies' findings with respect to the differences between distance education and traditional methods of course delivery. Some of the studies they identified are listed as follows:

1. Earlier studies conducted in the 1960s with adult populations of undergraduate and graduate students concluded that the programs were just as effective as traditional classes when teleconferencing was used as the predominant delivery method.

2. Blackwood and Trent in 1968 determined the effectiveness of audio teleconferencing between the amounts learned by telelecture and by face-to-face teaching indicated no perceivable difference.

3. Puzzuoli in 1970 examined comparative differences in achievement using audio teleconferencing. His findings indicated that students in remote classes performed as well as resident students.

4. Hoyt and Frye in 1972 performed a comparison of six undergraduate and graduate level courses taught by audio teleconferencing in identical on-campus classes. Results indicated that instruction with audio conferencing was as effective as traditional delivery methods.

5. Batey and Cowell in 1986 concluded that students' learning was comparable to traditional classes and their attitude toward distance education programs was just as positive. Their evaluation focused on K-12 and postsecondary institutions.

Current Comparative Studies

M. Gagne and Shepherd (2001) performed a comparative study that analyzed performances of two class sections, one face-to-face conventional class and the other an online distance education course, in an introductory graduate level accounting class. The groups were composed of a sample of convenience. The sample size was not reported. The same professor taught both classes using identical course formats. The method used to detect group differences was analysis of variance (ANOVA). Performance outcome measures were used to determine if there was a significant difference between a traditional, campus-based class and an asynchronous online class. The online and on-campus students differed in number of prior graduate hours in accounting. Students enrolled in the online distance education course were required to have at least three hours of accounting while the students in the campus-based course were not. The findings indicated that the performance of students were similar for both courses, therefore no significant difference was reported. Furthermore, the students' evaluations of the courses were the same, although students in the online course indicated that they were less satisfied with instructor availability than in the traditional class.

Spiceland and Hawkins (2002) conducted a study of graduate students enrolled in accounting courses at The University of Memphis. The sample consisted of 66 graduate students

enrolled in four sections of asynchronous online distance education courses. The course content was different; however, the format was identical. A 12-item survey instrument was given to determine whether students perceived differences in their learning effectiveness taking the course online or on-campus. The study did not include students currently enrolled in a similar traditional on-campus course. A series of *t* tests were used to measure mean differences. Findings indicated that students had a more positive attitude about courses in an online distance education environment. However, they had a less favorable response when comparing their perceived ability to learn material as effectively in an online class as opposed to a traditional classroom setting. Despite their negative perceptions, students had a positive attitude about their online experience with the use of e-mail and bulletin boards for communicating with the instructor.

Wegner, Holloway, and Garton (1999) determined that student test scores and satisfaction survey results from an online distance education were not significantly different compared to a traditional class's scores. Students were allowed to self-select between the traditional classroom course and an experimental online distance education course. The total sample size consisted of 31 graduate students enrolled in curriculum design and evaluation courses. The course structure was essentially the same for both groups; however, the online distance education class received training in using Web-based software, e-mail, and video conferencing. A *t* test was used to determine any significant differences between overall test scores of the two groups. Based upon end-of-course evaluations, even though results reported were not significant, students in the experimental online group had more positive feelings about the course than students' feelings in the traditional one.

Gunawardena and Boverie (1992) examined interaction among adult learning styles, media, methods of instruction, and group functioning in an online distance education class that

used audiogrpahics and computer-mediated communication. An audiographic's system utilizing two phone lines was the instructional delivery method for the distance class. Data and graphics were transmitted through a high-speed modem, a computer, graphics tablet, scanner, and a printer. E-mails were also used for group discussions and learner support. The total sample size of 71 graduate students was composed of 15 students in the online distance education class with the remainder enrolled in nonequivalent traditional face-to-face courses. One- and two-factor ANOVAs were used in the analysis. Different instructors taught the three different traditional classes. The results of the study indicated no significant difference in learning styles of distance and traditional learners. However, the traditional on-campus students experienced more satisfaction with the use of e-mail and audiogrpahics than their online counterparts did. Generalization of the results was limited due to the small sample size in the online distance education course.

In summary, previous research related to student learning strategies has identified self-efficacy, self-regulated learning strategies, prior computer experience, participation, and gender as contributing factors, and these studies have used an assortment of measurement techniques. Comparative studies were located that indicated both significant and no significant differences between traditional face-to-face instruction and online classes. These studies illustrate some of the challenges associated with distance learning research. There were no prior studies that focused on the impact of self-efficacy, self-regulated learning strategies, prior computer experience, participation, and gender on satisfaction in an online environment.

CHAPTER 3

METHOD

Research Design

This chapter describes the methods used in this study including descriptions of the participants, independent variables, dependent variable, instrumentation, data collection, and data analysis. The overall design of this study was a causal-comparative, nonrandomized design as defined by Gall et al. (2003). Survey research provided the framework for this study, which was conducted at a university setting. Dillman's (2000) Tailored Design Method was the basis for procedures and techniques used in collecting survey data from online self-administered questionnaires.

Research Questions

This study examined the effect of the level of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender on satisfaction among university students enrolled in online distance education courses. In examining the manner in which students' learning strategies and satisfaction interact, the following research questions were addressed:

1. How did students' satisfaction differ with respect to their level of self-efficacy in an online distance education course?

2. How did students' satisfaction differ with respect to their level of self-regulated learning strategies in an online distance education course?

3. How did students' satisfaction differ with respect to their level of prior computer experience in an online distance education course?

4. How did students' satisfaction differ with respect to their level of participation in an online distance education course?

5. How did students' satisfaction differ with respect to their gender in an online distance education course?

Causal-Comparative Design

An *ex post facto* or causal-comparative design was used for this study. This type of design lends itself to exploratory analysis where it is not feasible to control independent variables by manipulation or randomization (Ary, Jacobs, & Razavieh, 1996; Gall et al., 2003; Rojewski, 1997). Instead, comparisons are made between or among groups of individuals who differ with respect to certain characteristics. An example is the comparison of the effect of students with high levels of self-regulated learning strategies on students' satisfaction. In this instance, the independent variable, students' self-regulated learning strategies, is not manipulated in order to observe its effect on the dependent variable, satisfaction.

In education, most social-science research cannot use randomized field trials because it is unethical to create the conditions that would result in differences between groups (Gall et al., 2003). Social-science researchers therefore, in general, will observe relationships in nonexperimental settings and attempt to compensate statistically for any relevant variables. By obtaining measures of other variables that might influence the outcome (e.g., satisfaction) for this study, nonexperimental research was determined to be the most beneficial for testing effects of several important characteristics to discover a profile of students enrolled in online distance education courses.

Since causal-comparative studies are considered useful for making statements about an observed relationship between two variables, they were conducted in order to focus on the impact of certain variables that really matter in developing a greater understanding of learners' characteristics in distance learning courses. In this instance, there was the conceptualization of students' satisfaction as the effect. The possible causes of satisfaction with their online experience might be due to the effects of high, medium, or low categories of the independent variables, self-regulated learning strategies, self-efficacy, participation, prior computer experience, or gender (Gall et al., 2003). For these reasons, concepts associated with causal-comparative research design lend themselves to such situations where several relationships are being examined in a single study.

The design's major drawback is that results are not generalizable because of volunteers and samples of convenience. This makes it difficult to represent any positive conclusions regarding cause and effect. Generalizability is an important consideration for external validity where results of an experiment are limited unless they adequately represent major characteristics of the targeted population (Creswell, 2003). Despite their drawbacks, Keppel (1991) defended the use of nonexperimental designs by pointing out the differences between statistical and nonstatistical generalization. To him, while the former depended on random sampling, the latter depended on prior knowledge obtained about a particular area of research. The appropriateness of certain generalizations whether the research design was experimental or not, would depend on "the state of development of the research area and the extent to which extrapolations beyond the particular subjects tested have been successful in the past" (p. 18).

Survey Research

Survey research, in the form of self-administered questionnaires, provided the data for this study. R. Hill (2001) wrote, "One of the most prevalent types of research associated with theses and dissertations is survey research" (p. 201). Since questionnaires present all individuals in the sample the same questions, they enable researchers to draw inferences about characteristics and behaviors of populations from varied geographic regions with limited accessibility. An intact group of learners enrolled in an online distance education course is an example of limited accessibility. Additional benefits of self-administered questionnaires come from allowing respondents to be in control of the data-collection process. Students have the option of completing a survey at a time they find convenient, and they can maintain self-control over pacing and sequencing of their responses (Dillman, 1978, 2000; Gall et al., 2003; Harasim et al., 1997).

The purpose of survey research is to collect data from a sample that represents characteristics of the population to which a study's results can be generalized. Notwithstanding the limitations of generalizability posed by nonexperimental studies, survey research provides an understanding of the causes of certain phenomenon by examining variations of variables across cases and by looking for other characteristics that are considered analytically related (De Vaus, 2002).

Generally, surveys administered over the Internet result in variations in the type of respondents. If the population to be studied is known and identifiable, special efforts can be made to solicit specific groups of subjects and lessen some of the concerns of generalizability (Dillman, Tortora, & Bowker, 1998; Frary, 2002). For this study, passwords were used to restrict access to the questionnaires. Only students enrolled in approved online distance education

courses were sent information for getting into each survey. E-mail addresses were used to eliminate any duplicate entries.

Besides the ability to screen for legitimate participants, Internet surveys offer an inexpensive and efficient method for collecting and processing data. Mail surveys can take up to two months to complete, whereas Internet surveys eliminate lengthy delivery times. Moreover, Internet surveys can considerably reduce data entry error and increase flexibility in visual presentation and design (De Vaus, 2002; Dillman, 2000; Fowler, Jr., 2002). For this study, answers were instantaneously captured using server-side programming, i.e., the surveys ran on the server computer where the Web pages resided. The server-side application known as Common Gateway Interface (CGI) was composed in Perl, a fairly simple programming language that could be written with a text editor (Hamilton, 1999). Database operations were programmed to adapt figures to special reporting needs. Therefore, any modifications to questions or changes to the design were easily implemented, unlike mail or telephone questionnaires, which would have required considerably more time.

Some of the limitations of surveys administered over the Internet include sample restrictions, motivation, and absence of interviewer probing (Fowler, Jr., 2002). With respect to sample restrictions, for this study, potential respondents were required to volunteer. As a result, students could decline to take part. Given this constraint, sample bias posed a potential problem from the standpoint that students likely to volunteer possessed different characteristics than nonrespondents (Rosenthal & Rosnow, 1975).

Nonresponse error can occur when a significant number of people in a survey sample fail to respond to the questionnaire. The personality profile of nonrespondents could be important to the study (Belson, 1986). Research indicates that volunteers tend to be better educated, have

higher social status, possess more intelligence, are more altruistic, and more extraverted than are non-volunteers (Rosenthal & Rosnow, 1975). In order to reduce sample bias, an incentive drawing for a $100 gift certificate was offered. To further encourage participation, survey Web pages were designed for quick transmission speed (a seven-second download time per Web page). Additional efforts included guaranteeing confidentiality, and sending three follow-up e-mails as reminders (Dillman, 1978, 2000; Dillman & Bowker, 2001; Dillman et al., 1998; Fowler, Jr., 1993, 2002).

Responding to an online survey requires computer skills that are likely to differ widely among people who have access to the Internet. Some individuals are more experienced computer users than others (De Vaus, 2002; Osika & Sharp, 2002). This means that effective communication is essential for assisting respondents in the appropriate method for finishing a survey efficiently. Internet surveys that fail to take into account actions necessary for completing it will produce nonresponse and measurement errors. To provide error checking for this study's surveys, JavaScript (a programming language built into all major browsers) was used to warn respondents if identification was entered incorrectly or if answers were missed. If this were the case, immediate feedback appeared on the screen, "Not all items were checked. If you like, go back and complete. Otherwise, click Submit again" in an effort to reduce unintentional nonresponse (Schank, Fenton, Schlager, & Fusco, 1999).

Participants

Selection of Participants

Participants in this study included undergraduates and graduate students enrolled in asynchronous distance education courses at a major research university in the southeastern United States. Pilot testing occurred throughout the instrument development period. Participants

in the pilot test included graduate students in an information technology education course and a school law course. The samples for the study were samples of convenience and the students involved volunteered to participate. Participants in the final instrument administration were from a different information technology graduate-level course and a dual-level business education course in the college of education.

Professors were approached in face-to-face meetings to request their students to participate by completing the two surveys developed for the study. In one instance, the researcher actually addressed the class whereas in another, the professor inquired for volunteers by posting a bulletin-board announcement over the Internet. In both cases, professors were asked to give emphasis to the fact that participation was completely voluntary and whether they chose to take part or otherwise, course grades would not be affected. Furthermore, students were informed that the professor would not know who did or did not decide to take part in the study. For purposes of rewarding the incentive and identifying the winner of the prize drawing, participants were assigned a number, selected at random.

Sample Size

The total number of students that successfully completed the pilot study for the one online instructional technology course was 16. The goals of this experiment were to detect an effect with sufficient power with a significance level of $\alpha = .05$. Power was estimated at .21, i.e., if each group size was equal to five and there were three levels of comparison (N =15). The study would require 22 cases per level (N = 66) for an effect size of .40 to generate power equivalent to 82%. Power calculations were computed with a program, *Power and Precision,* developed by Borenstein, Rothstein, and Cohen (2000). The program allows the user to enter effect size (*f*) directly by using Cohen's (1988) conventions for research (small = .10, medium =

.25, and large = .40). Effect size is a value that can range from 0 to 1. Higher values are an indication of the magnitude of group differences (Maxwell & Delaney, 2000). Power analyses are beneficial for determining the sensitivity of a research design in detecting valid differences between groups.

Regardless of the minimum sample size and power needed for detecting group differences, it should be noted that identification and verification of sources of variances are just as important. Again, this study was nonexperimental in that the sample was not randomized and participants were required to volunteer. Therefore, past data on a factorial experiment, where participants were randomized and received different treatments, would not be comparable. At issue is that the same person for this study is taking all measurements. This may not be the case in similar studies with respect to online distance education. Since the combination of these factors affect error variance, it can be difficult to identify main sources of variation (Fowler, Jr., 2002). In view of the fact that the effect size is too large and the study is essentially underpowered, future improvements to study design, e.g., randomization, experimental conditions, and larger sample sizes could render more standardized results (Lenth, 2001; Thompson, 1999).

Course Content, Organization, and Requirements

Pilot study. The instructional technology course had 43 students registered for the semester. Some students were in their third year of a teacher certification program, while others were in their first term. This course represented a degree requirement for the school-media specialist program. All students, except for nine, were connected with a K-12 school. This was an asynchronous course with one face-to-face meeting scheduled at the beginning of the semester. Technical support was provided online as well as in the initial face-to-face meeting.

The course was organized by requirement topics posted to WebCT, an integrated, password protected e-learning system used for higher education. The course website included static information resources, such as readings, and dynamic resources from the Internet. Most of the communication was asynchronous via electronic mail and bulletin board discussions. All required work consisted of individualized readings and assignments. Synchronous discussions through chat rooms were encouraged as a means of maintaining virtual office hours. This allowed students to receive simultaneous feedback from the professor. The chat discussions were copied and archived for later access by all students.

The second course was comprised of graduate-level students enrolled in an add-on certification program for educational administration. This course pertained to school law and had 15 students registered. It represented one out of 18 one-semester hour courses that offered educators the opportunity to add Educational Leadership to their current educator certificate. This course was offered asynchronously with one face-to-face meeting scheduled at the beginning of the semester. It used only cooperative projects to complete written scenarios that were posted to the bulletin board by each group. There were no interactive discussions posted publicly on the bulletin board. Typically, students communicated with the professor privately through electronic mail.

Final study. The instructional technology course had 32 graduate students enrolled. This was a different course from the pilot study; however, the instructor was the same. As with the pilot study, this course represented degree requirements for school-media specialist. The course was asynchronous with one face-to-face meeting scheduled for the initial class meeting.

WebCT was used as the interface for delivering course content over the Internet. This course differed from the pilot study in that collaborate work was included as a required project.

In addition, weekly journal entries, preparation of personal web pages, and other individual projects were incorporated in the syllabus. For maintaining virtual office hours, Horizon Live software along with WebCT chat rooms was used. Horizon Live is a Web-based tool for conducting synchronous online sessions with two-way audio capabilities. A majority of the students registered for this course also participated in the pilot study.

The second course used for this study was a dual-level business education course. This course had 20 undergraduate and graduate students enrolled. Students participated in face-to-face meetings for the first and last class. Due to the limited face-to-face sessions, instruction was considered asynchronous. Chat room participation was mandatory for three class sessions and bulletin board discussions were scheduled four times throughout the semester. Both collaborative and individual assignments were required. The instructor also required completion of online quizzes each week at a set time.

Instrumentation, Pilot Study, and Instrument Administration

This study consisted of three phases. For the first phase, survey instruments were developed to determine prior computer experience, self-efficacy, self-regulated learning strategies, gender, and students' satisfaction with their online course experience. Phase two involved pilot testing the instruments with graduate-level students enrolled in online education courses. The final phase administered the revised instruments to undergraduate and graduate students registered in instructional technology and business education online courses in the college of education.

Phase One: Development of Survey Instruments

The survey instruments used for this research were offered at the beginning and at the end of the course (see Appendixes B and C for surveys). The initial questionnaire probed

participants for self-reported prior computer experience, online self-efficacy, and self-regulatory learning skills. The end-of-course questionnaire measured students' satisfaction with their online course experience. The self-regulatory learning skills section was adapted from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991). New instruments were developed to measure prior computer experience, self-efficacy, and satisfaction.

Review of the literature and variable identification. Survey instruments were developed consistent with the stages proposed by McClelland (1995). Those stages involved determining survey content and design, pilot testing, revising, and acquiring approval for distributing the survey. An extensive review of the literature disclosed that there were no comprehensive survey instruments for determining the various components of learners' characteristics in an online distance education environment. Phipps and Merisotis (1999) felt that there was a "paucity of true, original research dedicated to explaining or predicting phenomena related to distance learning" (p. 2). Several studies cited the importance of self-efficacy, self-regulated learning strategies, prior computer experience, and participation as characteristics that influenced satisfaction in online distance education classes (Bernard et al., 2000; Debowski et al., 2001; Schunk & Zimmerman, 1997; Wolfe, 2001). Therefore, a self-report questionnaire, based upon recommendations by Dillman (1978, 2000; Dillman & Bowker, 2001), was designed to address aspects of students' self-efficacy and learning strategies effects on satisfaction. Consistent with Phipps and Merisotis' proposals in their 1999 report prepared for the National Education Association, the survey instruments assisted in determining if students had the necessary skills to use technology, the best way to participate in asynchronous communication, and critical learner characteristics necessary for focusing on essential goals of learning and teaching in online classes. Moreover, demographic variables such as gender, age, education, and access to

computer equipment were selected for descriptive and comparative purposes based upon their likelihood to influence students' satisfaction (Fredericksen et al., 1999; Richardson & Swan, 2003; Stewart, Shields, Monolescu, & Taylor, 1999; Tucker, 2001). After the concepts used in the study were clarified, the instruments were validated by panel review, consensus group processing, and pilot testing.

Instrument construction. The online self-efficacy and learning strategies survey is a 64-item comprehensive instrument designed to measure three independent variables: (a) prior computer experience, (b) self-efficacy, and (c) self-regulated learning strategies. This questionnaire contained demographic questions, dichotomous questions, Likert scale questions, and one open-ended question requesting additional comments. In order to enhance the reliability of the survey, in most cases multiple-item indicators were used, i.e., unless it was felt that a single question sufficed, e.g., in determining whether students were proficient in sending e-mails (De Vaus, 2002; Fowler, Jr., 2002).

Demographic questions. The first seven items contained demographic information collected in the research and included gender, age, number of online courses previously taken, highest degree earned, current course load, whether that individual owned a computer, and if a computer was accessible when away from work or school. Questions were designed to determine students' familiarity with computers and online courses (Fredericksen et al., 1999; Merisotis & Phipps, 1999; Richardson & Swan, 2003).

Prior computer experience. In studies completed by Osika and Sharp (2002) and by Phipps and Merisotis (2000), several technical competencies for distance learning students were identified. The next six questions of this portion of the survey instrument (Items 8-13) relate to prior computer experience in an effort to differentiate between novice and expert users of

computer technologies. This study hypothesized that prior computer experience, ownership of a computer, and familiarity with word processing software would be associated with increased students' satisfaction. In an online distance education course, prior computer experience had been related to frequency in logging on to a course's website, amount of time engaged on a course's website, and the probability of taking additional online distance education courses in the future (J. Hill & Raven, 2000; Rosenkrans, 2001).

Students enrolled in the participating online courses were asked to self-report their level of expertise on four different computer experience categories: (a) word processing, (b) presentation software, (c) navigating the Web, and (d) using e-mail. Since the asynchronous courses for this study used WebCT, students had to be familiar with this software. WebCT is a computer program that facilitates the use of sophisticated web-based course material (Aliponga, 2003). Students are trained to access a WebCT course by registering. This gives them the right to use online materials, post messages, and upload their assignments. In order to do this successfully, they must be competent at using a variety of software that is employed in an online course (Rosenkrans, 2001). Otherwise, participants might procrastinate in writing communication or completing assignments because they may have low typing speeds and are unfamiliar with the technology and software for interfacing (McDonald, 2002). Their unfamiliarity and lack of technical competence could also prevent them from participating as effectively in online discussions (Osika & Sharp, 2002).

E-mail is another important technological tool consistently used in online courses that allows students to communicate regularly with fellow students and the instructor about their work (G. Moore, 1991). In asynchronous environments, since responses to queries are not always immediate, novice users can experience anxiety about properly sending messages

(Harasim et al., 1997). Therefore, students must have the necessary skills if they are to explore concepts using the Internet. Based upon survey results, responses were recorded using a 1- to 4-point Likert scale with 1 (*none*) indicating no experience to 4 (*expert*) indicating proficiency levels high enough for teaching others. Students' self-reported computer experience signified their skill level as either low or high.

Likert scales provided an effective and reliable ordering of participants' responses (Ary et al., 1996). Reliability results are considered good since Likert scales permit a greater range of answers. However, the scales' primary weakness relates to its lack of reproducibility in that the same total score may be obtained in more than one way. For this reason, according to Oppenheim (1992), examining patterns of responses can provide more interesting information than the overall score by itself. Another concern in using Likert scales relates to respondents' tendencies to avoid using the entire scale when completing surveys. Instead, a middle or neutral response is favored. To avoid any uncertainty about students' prior computer experience, for this study, a 4-point Likert scale was used to force a decision between novice and expert (Gillham, 2000).

Online self-efficacy. The next subsection of the instrument contained 19 questions relating to self-efficacy (Items 14-32). In view of the importance of self-efficacy in predicting students' satisfaction, and the lack of a specific instrument in the context of an online distance education environment, a new instrument was developed for measuring self-efficacy beliefs with online Web-course tools. The subscales identified were selected because of their relation to specific Web-course tools used in online distance education courses (Chang, 2000; Miltiadou & Chong, 2001). Web-course tools represent instructional features of an online course and include electronic mails (e-mails), chat sessions, and bulletin board discussions. Due to the intuitive

nature of computer interfaces, increasingly, students are expected to be proficient users of a range of software applications. The rationale for the scales development generally relates to the impact the Internet has had on many different aspects of life, particularly to the growing reliance in higher education on computer technology to facilitate learning (Spiceland & Hawkins, 2002). In online distance education courses, there is very little offered in the way of formal training. As such, low self-efficacy from an inability to perform in an online setting may be a deterrent to students exploring new applications essential for students' learning (Fredericksen et al., 1999; Schunk & Zimmerman, 1997). For these reasons, the development of an appropriate measure of self-efficacy in connection to online activities was used to identify students' strengths and weaknesses early in the program.

The instrument's scales included sub-sections to measure self-efficacy for simple and complex tasks on each application. Each sub-section comprised relevant tasks on which students rated the strength of their belief in their ability to perform them on a 5-point Likert-type scale. According to their level of confidence in completing each task, students self-selected a scale ranging from 1 (*not at all confident*), 2 (*rarely confident*), 3 (*sometimes confident*), 4 (*often confident*), to 5 (*always confident*; Bandura, 2001). High scores signified individuals believed they possessed the capabilities and confidence to perform the assigned task. Items were adapted to the conceptual definition of online self-efficacy by wording them as students' judgments of their confidence in using Web-course tools for completing specific tasks (Pintrich & De Groot, 1990; Pintrich et al., 1991). Bandura (1986) stated, "Among the different aspects of self-knowledge, perhaps none is more influential in people's everyday lives than conceptions of their personal efficacy" (p. 390). Furthermore, all items constructed for this section were positively worded.

Substantive limitations of the questionnaire were task specificities of the technologies being measured. Since self-efficacy is based on self-perceptions regarding certain behaviors, the construct is considered situation specific (Vispoel & Chen, 1990). Therefore, Bandura (1986) and Pajares (1996) maintained that an effectual assessment of self-efficacy should evaluate specific skills and needs and target the precise psychological domain being explored. Cronbach and Meehl (1955) defined construct as, "Some postulated attribute of people, assumed to be reflected in test performance. In test validation, the attribute about which we make statements in interpreting a test is a construct" (p. 283). Subscales of the construct self-efficacy measured in the questionnaire and sample items are found in Table 1.

Table 1

Online Self-Efficacy Subscales and Sample Items

Subscale (Number of items)	Sample item
Internet performance expectations (8)	Using the Internet, how confident do you feel accessing a Web browser, e.g., Netscape or Internet Explorer?
Asynchronous performance expectations:	
Bulletin board (4)	Using bulletin/discussion board features, how confident do you feel replying to a topic for viewing by all members of the discussion?
E-mail (4)	Using e-mail to communicate with instructor(s) or other students, how confident do you feel sending e-mail to a specific student?
Synchronous performance expectations (3)	Participating in a "live" (synchronous) chat session, how confident are you reading messages from more than one student?

Internet performance expectations represent students' ability to navigate the Web. Students will continue to persist at a difficult task if they are effective at utilizing information accessed on the Internet (Pintrich & De Groot, 1990). The amount of experience gained in working with Internet-based courses is expected to enhance their attitude and create a positive attitude toward online courses (Arbaugh, 2000). A study by Easton and LaRose (2000) established that prior Internet experience and Internet use were positively correlated to Internet self-efficacy. Alternately, stress and self-disparagement were experienced by students if they perceived their Internet usage as ineffective and resulted in negative self-efficacy. The scale's purpose, for this study, was an attempt to identify students who found it difficult to exploit an online learning situation that relied heavily on computer technologies.

Asynchronous performance expectations are an indication of students' level of comfort when communicating by means of bulletin board discussions and e-mail. The ability of developing social ties and exchanging information has a direct influence on participants' outcomes in online distance education settings (Arbaugh, 2000). Being able to utilize computer mediated communication by posting messages and reading threaded discussions determines students' judgments of their skills for performing successfully. Bandura (1993, 1994, 1997) suggested that the perception of a student's ability to perform a task increases the likelihood that the task will be completed effectively. As a result, it is important to provide measures for establishing students' familiarity with Web-course tools.

In conjunction with Internet and asynchronous performance expectations, synchronous communication routines are another essential tool in online performance in that they can maximize computer-mediated dialogue and minimize transactional distance (Saba, 1988). Synchronous discussions are an important activity for stimulating online group interactions

(Rosenkrans, 2001). Sometimes online conversations can proceed at a very fast pace with several exchanges per minute making it extremely difficult for novice computer users to keep up (Brem, 2002). Consequently, students' confidence in their proficiency for communicating in real time will have a positive bearing on their satisfaction with their online experience.

Self-regulated learning strategies. This section of the instrument contained 31 questions. This was a separate section labeled *Final Section* and contained Items 1-31. It represented an adapted version of the Motivated Strategies for Learning Questionnair*e* (MSLQ) developed by Pintrich et al. (1991). MSLQ is a self-report instrument designed as a paper and pencil test to assess college students' motivational orientations and their use of different learning strategies for a college course (McKeachie, 1995; Pintrich & De Groot, 1990). MSLQ has two sections. The motivation section is composed of 31 items that measure students' goals and value beliefs for a course. The second section, learning strategies, includes 31 items regarding students' use of different cognitive and metacognitive strategies and 19 items concerning student management of different resources. There are 15 different scales on the MSLQ that can be used together or singly.

As this study is attempting to measure self-regulated learning strategies, the metacognitive self-regulation and resource management subscales consisting of 31 items were used. These particular scales were chosen because they test for those self-regulatory strategies, which might apply to an online distance education environment (Corno & Mandinach, 1983; Kerlin, 1992). The five subscales relative to self-regulated learning strategies are: (a) metacognitive self-regulation, (b) time and study environment, (c) effort regulation, (d) peer learning, and (e) help seeking. Subscales and sample items from the questionnaire are included in Table 2.

Table 2

Self-Regulated Learning Strategies Subscales and Sample Items

Subscale (Number of items)	Sample item
When you study for this class, how true are these statements about you?	
Metacognitive self-regulation (12)	During instruction, I often miss important points because I'm thinking of other things.
Time and study environment (8)	I usually study in a place where I can concentrate on my course work.
Effort regulation (4)	I often feel so lazy or bored when I study that I quit before I finish what I planned to do.
Peer learning (3)	When studying, I often set aside time to discuss course material online or by e-mail with a group of students from the class.
Help seeking (4)	Even if I have trouble learning the material in this course, I try to do the work on my own, without help from anyone.

Metacognitive self-regulation subscale items are described by Pintrich et al. (1991) as planning, monitoring, and regulating activities. Planning activities include goal setting and task analysis. These are important for triggering prior knowledge, which in turn makes understanding and comprehension possible. Monitoring activities involve awareness of attention while reading. Students constantly endeavor to self-test their knowledge and question themselves as they go along. Regulating activities refer to learners' abilities to check and correct their behavior as they progress. If they feel that their progress is slow, students will self-regulate by adapting current skills to overcome obstacles (Butler & Winne, 1995; Winne, 1995a).

Time and study environment items pertain to students' ability to manage and regulate their time and study setting in order to maximize their learning experience. Highly self-regulated learners will discourage excessive noise or distractions and will set aside blocks of time for effective studying. They also tend to make rational judgments about the time that is realistically necessary for them to successfully complete their study requirements (Winne, 1995a, 1995b).

Items relative to effort regulation measure students' perseverance in the face of difficulties or challenges. If obstacles occur, reasons for persisting at studying are reevaluated. They have developed an awareness of what they know and believe, and as self-regulated learners adjust their goals accordingly (Hargis, 2000).

Peer learning involves collaboration with other classmates in order to develop insights and cultivate understanding. Self-regulation encourages the interchange of ideas for eventual synthesis and confirmation of perceived competence (Zimmerman, 1995).

Help seeking pertains to the ability to know when to ask questions. Highly self-regulated learners will seek out information when they feel they need to do so. According to Zimmerman (1989), social support from the learning community is widely used by self-regulators.

Some items in the MSLQ subsections were negatively worded. These items' ratings were reversed in the programming script before calculating an individual score. On the original MSLQ, students rated themselves on a 7-point Likert-type scale from 1 (*not at all true of me*) to 7 (v*ery true of me*). Since the entire questionnaire consisted of 64 items, for this study, five levels of response were considered sufficient for discriminating against interval differences. The revised scale ranged from 1 (*not at all true of me*), 2 (*rarely true of me*), 3 (*sometimes true of me*), 4 (*often true of me*) to 5 (a*lways true of me*). A high score indicated students were metacognitively capable of monitoring and guiding their own learning. As indicated by R. Hill

(2001), four or five levels are considered sufficient to signify response direction and are adequate for most studies. Scale point proliferation can annoy or confuse participants with differences between response levels that are difficult to distinguish. Prior research indicated that respondents cannot distinguish between more than six or seven levels and that total score variance is largely a result of direction rather than intensity of choice (Frary, 2002). By decreasing the interval in the revised scales hopefully, respondents are prevented from becoming annoyed and not completing the questionnaire. It should be noted however, that Bandura (2001) along with Pajares, Hartley, and Valiante (2001) preferred a 0 to 100 format, believing that students were more responsive to a larger scale since it mimicked the way they were typically graded in school.

Three of the questions from MSLQ were modified to accommodate students in an online distance education environment. For example, an original statement was, "During class time I often miss important points because I'm thinking of other things." In the revised version, this item reads, "During online sessions, I often miss important points because I'm thinking of other things." Another item was altered from, "When studying for this course, I often set aside time to discuss course material with a group of students from the class" to "When studying, I often set aside time to discuss course material online with a group of students from the class." Finally, "If I get confused taking notes in class, I make sure I sort it out afterwards" was changed to "If I get confused during an online session or while making notes, I make sure I sort it out afterwards."

Development of the online satisfaction instrument. This questionnaire, which contained 23 questions pertaining to satisfaction, was released to students during the final two weeks of each course. The first five items contained demographic information collected in the research and included gender, age, number of online courses previously taken, highest degree earned, and current major. Items 6-22 were specifically tailored to assess students' satisfaction with their

online course. The last question, Item 23, was an open-ended question requesting any additional comments related to students' satisfaction.

Due to the importance of satisfaction in predicting students' learning and the lack of empirically validated instruments in the context of an online distance education environment, a new instrument for measuring satisfaction was developed. While the primary focus was on self-regulated learning strategies and self-efficacy (cognitive dimension), it was also important to consider satisfaction (affective dimension) of the learning experience for students (Huberty, 1994). Student performance in an online distance education environment is affected by learning strategies, prior knowledge, participation, available study time, and satisfaction (Picciano, 2002). Online learners need frequent evidence of success as they progress through the learning process because it supports their feelings of satisfaction (Gunawardena & Zittle, 1997). Social factors such as the degree of support, connectedness, and peer feedback have been found to be strong determinants of success and satisfaction in online courses distance education courses (Fredericksen et al., 1999; Gunawardena & Boverie, 1992; Wegner et al., 1999). The rationale for the items on the questionnaire related to its impact on students' satisfaction. According to a survey conducted by SUNY Learning Network (Fredericksen et al.), 1,406 students rated teacher interaction as the most significant factor in determining their satisfaction with an online course. Interaction with classmates and technical support were additional significant indicators confirmed by SUNY's study.

According to their level of satisfaction with each item, students self-selected a scale ranging from 1 (*very unsatisfied*), 2 (*unsatisfied*), 3 (*satisfied*), to 4 (*very satisfied*). All items in the questionnaire were positively worded. High scores were an indication of students' satisfaction with their online learning environment. The three subscales relative to students'

satisfaction were identified as: (a) teacher interaction, (b) classmate interaction, and (c) technical support. Subscales and sample items from the questionnaire are presented in Table 3.

Table 3

Satisfaction Subscales and Sample Items

Subscale (Number of items)	Sample item
	How satisfied are you with regard to. . .
Teacher interaction (10)	receiving feedback about questions and assignments from the instructor?
Classmate interaction (5)	amount of interaction with classmates?
Technical support (2)	access to technical support (via e-mail or phone)?

The items in the subscale relating to teacher interaction referred to the availability and organization of course material along with adequacy of feedback. Feedback is an inherent catalyst for self-regulated learners. Teachers must ensure that feedback becomes a productive social experience (McLoughlin & Luca, 2002). Feedback describes the characteristics of outcomes and the qualities of cognitive processing (Butler & Winne, 1995). Concerning course organization, results of prior studies indicate that students' learning is inadequate in linear Web-based hypermedia environments where they have too many choices (McManus, 2000). Thus, providing easy, understandable access to course material and assignments is important for ensuring students' satisfaction.

Classmates' interaction subscale items were based upon students' experiences with chat room discussions, bulletin board discussions, and the importance of feedback from their peers. (Arbaugh, 2000) determined that only the variables associated with classroom interaction were significant indicators in students' ability to learn in an online setting. Abrahamson (1998)

maintained that one of the most significant benefits of students becoming involved with each other was their feedback. Learner-to-learner interaction represents the exchange of ideas and information that occurs between students to help them coordinate study tactics. Of importance are the social-environmental sources of influence that can positively influence learners' self-efficacy and self-regulation (Zimmerman, 1995).

The adequacy of technical support provided the final subscale for the online satisfaction survey. Since discussions are conducted on varying levels and speeds, and responses can be incredibly delayed, students can have a difficult time following communication in an online distance education setting. If students have limited access and low technical skills, they will likely procrastinate in participating and completing course assignments. Becoming comfortable with an online conferencing system can be overwhelming for some students. Therefore, providing assistance with user interfaces is instrumental for increasing students' satisfaction (McDonald, 2002).

Phase Two: Pilot Study

Panel reviews. Initial drafts of survey instruments were reviewed for construct and content validity by five university professors who served on the researcher's doctoral committee. These content consultants included an instructional technology professor and two professors in technology education. All of the members had experience in survey development for purposes of research. Panel members were asked to review the survey items to determine whether they adequately reflected the constructs of self-efficacy and self-regulation along with prior computer experience and satisfaction. In addition, panel members provided comments, suggestions, and recommended revisions regarding the structure of each questionnaire (Hamlin, 1998).

To facilitate the decision-making process, the panel was given the cover letter and survey instruments accompanied by a form delineating review criteria (see Appendix D). The form provided a theoretical perspective of each construct and a list of corresponding item numbers. After completion, a consensus decision-making process was used to finalize the surveys' contents. A consensus decision represents a reasonable decision that every member of the panel can recognize. The input and ideas of all participants are gathered and synthesized to arrive at a final decision acceptable to everyone (Joppe, 2003; Knodel, 1993; Krueger, 1993). Consensus does not necessarily have to represent 100% agreement between all parties involved (Frey & Fontana, 1993; Morgan, 1993; Morgan & Krueger, 1993). Erffmeyer and Lane (1984) stated, "Decisions made by the consensus groups were of significantly higher quality than those of the interacting groups" or those using Nominal Group Techniques (p. 525). E-mails were exchanged regarding each topic and the direction of consensus. Revisions were made based upon the university professors' recommendations.

According to the committee's suggestions, there was concern over the excessive length of the cover letter, which contained 650 words and 12 paragraphs. In this instance, the cover letter served as the consent form and Web site's welcome page. This was the first Web page displayed when students were directed to the survey site. This also served as the area where students were required to enter a password and their e-mail address. Dillman's (2000) policy was that introductory messages of Web questionnaires should be short and help students get to the content with minimal effort. If the questionnaire looks too difficult or requires too much effort, students are less likely to participate. Unfortunately, content was mandated by the university's review board, and as such, necessitated extensive disclaimers regarding confidentiality and voluntary participation requirements. To compensate for the excessive length and to encourage students to

focus on important criteria, it was determined that a couple of paragraphs could be highlighted. This resulted in a more visually directed format.

Additional feedback from panelists included deleting items related to creating Web pages in the online self-efficacy section. It was decided that these were inappropriate qualifications for some online courses. Another suggestion recommended clarifying Web course tools in the instructions and formatting the sentence in bold that read, "Your responses will have absolutely no bearing on your course grade."

A second panel comprised of one undergraduate and four graduate students, having varying levels of experience with online distance education courses, was assembled. The panel members were selected based on their similarities to those to whom instruments would finally be administered (De Vaus, 2002). The revised cover letter/consent form and surveys after the first round review were placed on the Internet. Participants were directed to the survey's Web site and asked to complete a survey review criteria form (see Appendix D). The review criteria were based upon Dillman's (2000) principles for constructing Web surveys. Questions focused on the Web site's consistency, readability, navigational flow, and visual appearance by identifying panelists' accessibility from different operating systems and browsers. Furthermore, panel members were asked to indicate how long it took them to complete both surveys. Prior research maintains that long surveys have lower response rates (Gunn, 2002). As suggestions were received, other panel members were kept abreast of concerns and proposals for changes.

From the panel's suggestions, additional modifications were made to the instruments. For one thing, the panel agreed that it was difficult to keep scrolling back up the screen to ascertain scale labels for degree of intensity. As a result, column labels were placed periodically throughout the survey. One member felt that scoring on the self-regulated section should be

clearer, i.e. the reverse scored items were inappropriate. However, reverse scoring is advantageous for identifying indications of high self-regulation versus low self-regulation (De Vaus, 2002). These items were also integral to the original MSLQ instrument. Therefore, it was determined that the reverse-scored items should remain.

Pilot test. Based upon the above changes, students that were registered in selected asynchronous online graduate-level courses were asked to volunteer to participate in the pilot study. A proposal for the study was submitted to the Human Research Board (HRB) at the University of Georgia and subsequent approval was received. Pilot testing was instrumental in gathering information to determine validity and reliability for each survey (Belson, 1986; Dillman, 2000; Gall et al., 2003; Gillham, 2000; Oppenheim, 1992). During the procedure, participants were asked for any comments concerning the instruments and the survey process. All students seemed to interpret the connotation of questionnaire items as intended.

Two different online classes were recruited for the pilot study. One instructional technology course had 43 students registered for the semester. Some students were in their third year of a teacher certification program, whereas others were in their first term. This was an asynchronous course with one face-to-face meeting scheduled at the beginning of the semester. The second online class consisted of graduate-level students enrolled in an add-on certification program for educational administration. This course pertained to school law with 15 students registered.

In the instructional technology course, 16 students volunteered and satisfactorily completed both survey instruments. Three of students were male, whereas 13 students were female (65%). Fourteen of the participants (70%) were currently enrolled for two courses (including the current one), and two were registered for three courses. In the school law course,

only four students volunteered and completed both surveys. Of these students, all four were male. All were currently enrolled in seven one semester-hour classes. The ages of students ranged from 23 to 51 years (M = 36). All four participants in the school law course had master's degrees, while there were only four in the instructional technology course that did. The remaining 11 in the instructional technology class had bachelor's degrees, while only one participant indicated "other" as a degree. Twenty of the students reported that they owned a computer, and 19 (95%) indicated they had access to a computer when not in school or at work.

The online self-efficacy and learning strategies survey was administered first. The original intent was to make it available at the beginning of the semester. However, due to panel reviews and delays with HRB, the survey was not functional with Internet access until after the midway point. The online satisfaction survey was provided at the end of the semester.

The pilot study began November 24, 2003 and finished December 15, 2003. Students were informed about the availability of the surveys through each course's WebCT e-mail. The first e-mail, which was sent to students individually, stressed the importance of completing both surveys in order for a chance to win a $100 gift certificate at a major online retailer. Students were told that participation was voluntary and that all identifying information would remain confidential. Randomly selected numbers were assigned to each student for identification purposes and for the lottery drawing. Those numbers were provided in each e-mail along with password information. The Web site's link for the surveys was also included. A week later, another reminder was sent to students that had not yet completed the survey. Since the online self-efficacy and learning strategies survey was made available late in the semester, about two weeks later the online satisfaction survey was released. At that time, students were sent a third e-mail encouraging them to take both surveys and again, password information and identifying

numbers were supplied. On December 15, 2003, one number from each course was drawn from a bag of participant's numbers that had completed both surveys. An independent third party drew two numbers and verified each one. An e-mail was sent to the winners informing them how to access their online gift certificate for $100.00. In addition, winning numbers were posted on the survey's Web site.

Pilot test response rate. The response rate is a method for the evaluation of a data collection endeavor (Fowler, Jr., 1993, 2002). It is calculated by dividing the total number of people responding by the total number of people sampled. In this case, the total responses were 20 and the total sampled were 58, resulting in a 34.48% response rate with minimal item nonresponse (Huck, 2000). Gillham (2000) addressed response rates as follows:

> This depends on whether the respondents know you personally, on whether the questionnaire is seen as interesting and worthwhile to complete (and when did you last see one that was like that?) and the amount of time and trouble that has to be expended to complete and return it. . . . 'Impersonal' questionnaires typically attract a response rate of around 30 per cent, although follow-up requests may increase this by up to a third. Over 50 percent has to be accounted a good response. A 'captive' group – students in a lecture hall, staff at a training meeting – can mean a response rate of nearly 100 percent. (p. 9)

Since the courses for this study were asynchronous, it was not possible to determine the background of nonresponders, or if they were different in critical aspects. Therefore, bias, where error is inclined to go in one direction more than another, cannot be adequately established. Kalton (1983) felt it was important to distinguish between unit nonresponse and item nonresponse. Unit nonresponse occurs when there is no information collected from a sample. It is attributable to refusal, failure to contact, or the inability to participate. Item nonresponse

occurs when people respond to the survey but fail to provide answers to some of the questions. This may be due to the lack of necessary information to answer the question or failure to make the effort. Observable information about non-responders such as records about gender, age, education, and so forth was inaccessible to the researcher. This was one of the major drawbacks associated with Web-based surveys (De Vaus, 2002; Fowler, Jr., 2002).

Instrument reliability. The next procedure determined internal consistency of the instruments' set of descriptors and stability from one administration to another one. Reliability represents the extent an instrument is consistent in measuring what it is proposing to measure (Ary et al., 1996). Using the surveys administered in the pilot study (N = 20), internal consistency reliability was calculated using Cronbach's alpha. Cronbach's alpha can be used with instruments that are scored with a Likert-type response format (Huck, 2000). A higher coefficient alpha is an indication of greater consistency in responses among items (Green, Salkind, & Akey, 2000).

The constructs measured with the online self-efficacy and learning strategies survey were divided into sections. Internal consistency estimates of reliability of the six items relating to prior computer experience (r = .81) indicated satisfactory reliability. An online self-efficacy score was constructed from responses to 19 items. Cronbach's alpha reliability coefficient for this score was .87. The alpha coefficients ranged from .49 (Synchronous performance expectations) to .88 (Internet performance expectations). Generally speaking, the higher the alpha, the more reliable the test is. It is a common misconception that a low alpha is an indication that a test is bad. The test, in fact, measured several latent dimensions rather than one and as a result, the Cronbach alpha was deflated (Yu, 2001).

In addition to Cronbach's alpha reliability coefficient calculations for online self-efficacy, a factor analysis was used to analyze online self-efficacy data. Based on the factor extraction data, eigenvalues, scree plot, and variance, a specific number of factors, four, were identified. The factor analysis revealed four factors that together accounted for 86% of the shared variance. The eight Internet performance expectations items loaded heavily on the first factor; the four asynchronous performance bulletin board items loaded heavily on the second factor; and the four asynchronous performance e-mail items loaded heavily on the third factor. The fourth factor reflected the existence of a moderate correlation between Item 30 and 31 (r = .61, p = .004). It should be noted that the correlation matrix being analyzed was not positive definite. Therefore, the maximum likelihood estimation performed poorly. In all likelihood, this was due to the small sample size (Scientific Software International, 2000).

Modifications to the MSLQ, Motivated Strategies for Learning Questionnaire, from a 7-point Likert-type scale to a 5-point produced an alpha coefficient of .91. From the pilot study, there were 31 items in this section with alphas ranging from .70 (Help Seeking) to .86 (Metacognitive Self-Regulation).

Reliability and validity data for the original MSLQ was obtained from traditional classrooms. The first data collection occurred in 1986 and included 326 college students. Initially, when the questionnaire was developed in 1982, over 1000 University of Michigan undergraduate students were given the survey, and revisions were based upon results of internal reliability coefficient computations, factor analyses, and correlations. What followed was the development of fifteen different scales on the MSLQ, which were designed to be used together or singly. The previous alphas for the five subsections used for this study ranged from .52 to .79 (Pintrich et al., 1991).

Prior research has indicated that metacognitive self-regulation scales seem to be a reliable and valid measure of self-regulated learning when administered in a Web-based learning environment (Joo et al., 2000; McManus, 2000). The McManus study, in its modification of MSLQ scales, reported a Cronbach reliability coefficient of .67 for the metacognitive self-regulation scales. Since self-regulated learning is an amalgam of many cognitive, metacognitive, motivational, and social factors that effect learners' approaches to learning, the construct remains difficult to measure (Corno & Mandinach, 1983; Pintrich, 2002; Zimmerman, 1989). Researchers have yet to determine conclusively whether a learner is self-regulating while in a specific instructional Web-based environment.

In determining reliability of the online satisfaction survey, there were three items, out of 17, missing a response. Since the sample size was small, missing values would have unduly reduced the number of cases available for analysis, from 20 to 16 cases (a 20% reduction in sample size). The mean replacement method using SPSS® was used to replace missing data (De Vaus, 2002). The coefficient alpha for the 17-item survey was a robust .97 with alphas ranging from .82 (Technical support) to .95 (Teacher interaction).

Phase Three: Instrument Administration

After pilot testing, revised instruments were prepared for delivery online (see Appendix E). In January 2004, once human subjects protocol approval was received, 32 e-mails were sent to students enrolled in an instructional technology online course. An additional 20 e-mails were sent to students in a business education online course informing them that surveys were available. The Internet address to the online self-efficacy and learning strategies survey was provided as a link. E-mails were prepared as individual messages to each potential respondent using the cut and paste features of WebCT e-mail software and sent to everyone at the same

time. Dillman (2000) advised against sending a mass message since he considered personalization important to receiving responses. Each e-mail emphasized the importance of completing the survey and provided instructions on entering passwords and identification procedures. Dillman also recommended signing each letter, i.e. using a "real signature"; however, the software could not accommodate that (p. 162).

Both questionnaires contained the same consent form used in the pilot study (see Appendix E). Since the surveys were administered online, by entering their identification and password, students indicated their willingness to participate. Students were plainly advised that they were consenting to participate in the research and that their online discussions would be documented and used to analyze patterns of interaction and structural features.

Modifications to the pilot study instruments included slight revisions to Item 4 in the final section of the online self-efficacy and learning strategies questionnaire. Originally it read, "When reading, I make up questions to help focus on the material?" The revised question asked, "When reading for this course, I make up questions to help focus on the material?" Item 23 was changed to, "I make sure I keep up with the weekly readings, discussions, and assignments for this course" from "I make sure that I keep up with the daily or weekly readings, discussions, and assignments for this course." Item 24 was altered to read, "I log on to this course to monitor new discussion postings and e-mail regularly" from "I log on to this course to monitor new discussion postings and e-mail on a daily basis." Even though Item 4 had an item-total correlation of .63, the question was potentially confusing since one student expressed uncertainty about whether these surveys were related to all online course experiences or just this current one. Items 23 and 24 had item-total correlations below .30 (.28 and .03, respectively). Both items were included in the Time and Study Environment subscale. In assessing these items, the use of the word *daily*

was considered problematic. Dillman's (1978) Total Design Method maintained that in evaluating items, a fine line existed between vagueness and preciseness. Students cannot recall exactly the number of times they perform a specific act so substituting *regularly* for *daily* was an essential compromise. Deleting the items would not have substantially increased coefficient alphas; however, it was felt that by revising the wording, the items supported increasing their reliability.

Scores for prior computer experience, online self-efficacy, and self-regulated learning strategies were tabulated separately. High scores for prior computer experience indicated that students were experienced computer users. High scores for self-efficacy meant that students were confident in their ability to accomplish and then perform a task. Moreover, high scores in self-regulated learning strategies showed that students who could successfully plan, monitor, and regulate their cognitive activities had favorable perceptions of the class (Pintrich, 2002; Pintrich & De Groot, 1990; Pintrich et al., 1991)

The Web surveys were designed to scroll from the first question to the end. This method was preferred by Dillman (2000) who felt it most resembled the general experience of using the Web. Instead of presenting each question on a separate screen, scrolling is considered one of the most prevalent practices in Web questionnaire design. Scrolling required less contact with the server and therefore conserved computer resources, resulting in faster downloads. If respondents lost their place or concentration, they could easily go back and see how they answered questions previously (Dillman et al., 1998). In addition, the horizontal dimensions of the display were set at 750 pixels. Pixels are the unit of measure for computer screen resolution. To avoid horizontal scrolling in order to see all of the answer categories, it was necessary that the questionnaires be designed to prevent changing configurations on different computers. Choosing this width

facilitates printing the entire Web page and allows room for the browser's scroll bar (Dahm, 1998).

Each of the questions for measuring constructs had radio buttons that could be checked to mark the respondent's answers. The only exceptions were the first three questions of the surveys, which had text input boxes for posting information. A "submit" button was located at the bottom of the Web page for respondents to send survey results to the database. Each question began with a number revealing where the respondent should start to read. Frary (2002) recommended that response categories should be represented as a progression between lower levels to a higher one, in left-to-right order. Therefore, scales were numbered and labeled in column headings starting with 1 and ending at 4 or 5. In addition, answer spaces were listed horizontally and separated from the question stem (Dillman, 2000). Each survey also had one open-ended question at the end with a text input box for any additional comments.

Once respondents completed the questionnaire, they received their score immediately along with an explanation of its meaning (see Appendix E). Included in students' feedback was a brief definition of self-efficacy and learning strategies. In addition, a range of scores and their meanings assisted students in interpreting their level of each construct. Respondents were also presented with a message at the end stating; "Thank you for participating in my survey" (see Appendix E). In all, the total period of data collection was January 21 through May 5, 2004 for both surveys.

Data Collection Procedures

According to Dillman's (2000) Tailored Design Method, an updated version of his 1978 Total Design Method, follow-up e-mails were sent to nonrespondents of the self-efficacy and learning strategies survey through February 2004 to improve survey response rates. Dillman's

findings indicated that repeated contacts were essential to increasing responses to online surveys. Each reminder reiterated the confidentiality of results and asked students for their cooperation in completing both surveys. There were at least three follow-up contacts sent a week to 10 days apart to nonrespondents. E-mails were transmitted through WebCT to each of the students registered. Letters addressed students individually by their names since mass mailings to several contacts at one time were discouraged by Dillman. Each follow up was designed to use a different type of approach for encouraging students to go to the website and complete the surveys. The importance for taking the survey, the value to the research community by participating, and benefits to recipients were included in all correspondence (see Appendix F).

The online satisfaction survey was made available on April 15, 2004. There were no modifications to the original survey used in the pilot study. Again, four follow-up e-mails were sent to nonrespondents. In each e-mail, participants were instructed about the importance of completing the survey and reaffirmed that it was voluntary and confidential (Dillman, 2000). Surveys were available until May 5, 2004.

A follow-up to collect data on nonrespondents in an attempt to gain insight into their characteristics was conducted. An e-mail was sent to individuals that did not participate asking them for any information that would provide data about their characteristics (see Appendix F for a sample e-mail; Mertler, 2003). There were absolutely no replies. From a compilation of return rate research assimilated by Armstrong (1991), he cited Futrell and Lamb's 1982 findings that follow-up letters were not effective. In fact, even resending questionnaires did not result in an increase in surveys returned. To address the question of possible nonresponse bias, early and late respondents were compared to each other (Cook, Heath, & Thompson, 2000; Kalton, 1983).

According to the ‘continuum of resistance model’ examined by Lin and Schaeffer (1995), late respondents could be used as a proxy for nonrespondents in estimating nonresponse bias.

In order to explain nonresponse, a wave analysis was performed. This can be done in one of two ways. The first approach is to evaluate any significant differences among early and late respondents during the response period within a single wave of responses from week to week. Another method is to evaluate the significance between the mailing waves (Hikmet & Chen, 2003). For this study, the second method of investigating mailing waves, or in this instance e-mailing, was used.

To insure confidentiality, participants’ were identified only by designated identification numbers assigned from a random table. Survey data from the server was imported directly into an Excel spreadsheet. E-mail addresses were used only to eliminate duplicate entries. Otherwise, all supporting worksheets used identification numbers to classify data for statistical analysis.

As survey responses were received, the date of their response was recorded in a data file on the Web server. The number of returns and nonreturns were noted and wave analysis was used to determine response rates. Table 4 illustrates the response rate by wave and by survey treatment. It was determined that a test of significance would not be beneficial since the sample size was so small. A chi-square test would be suitable under other circumstances to establish whether the proportions of individuals who were late responders were equal to nonresponders. However, the chi-square test would not likely yield significance if the sample proportions for the categories differed greatly from the hypothesized proportions as in Sample #2 (S_2). In addition, chi-square is inappropriate if the expected count is less than five in 20% of the cells or more. Therefore, nonresponse bias was a concern with S_2 (Green et al., 2000). Since little was known about the population for S_2, the inferential process was a concern. Valid inferences can only be

extended to students who actually responded, not to all of the individuals in the class who were asked to respond (Huck, 2000). For Sample #1 (S_1), since over 73% of the students completed both surveys after the second e-mail, nonresponse bias was not a problem.

Table 4

Survey Disposition and Response Rates for Satisfaction Survey

	Sample S_1		Sample S_2	
Description	Number	Response Rate by Wave (Percent)	Number	Response Rate by Wave (Percent)
01/21/2004 1st e-mail sent to sample population	18		31	
Responses	6	33.3	6	19.4
01/29/2004 2nd e-mail reminder sent to nonresponders	12		25	
Responses	5	27.7	1	03.3
02/16/2004 3rd e-mail reminder sent to nonresponders	7		24	
Undeliverable			1	
Responses	2	11.0	1	03.3
02/26/2004 4th e-mail reminder sent	5		23	
Responses	2	11.0	3	10.0
Total responses	15	83.0	11	37.0

Data Analysis

Research Questions 1-2

In order to determine how students' satisfaction with their online course differed with respect to their level of self-efficacy and self-regulated learning strategies, data analysis

consisted of separate one-way analysis of variance (ANOVA). Since the researcher was interested in examining each construct individually, a series of one-way ANOVAs were conducted to determine if there were significant differences between high, medium, and low groups with respect to satisfaction (Olejnik & Hess, 1997; Oliver & Hinkle, 1982). ANOVAs were chosen because they support the comparison of mean scores from three groups of scores (Huck, 2000; Keselman, Huberty, Lix, & Olejnik, 1998). Generally, ANOVA is robust to violations of the normality assumption and to moderate violations of homogeneity of variance (Maxwell & Delaney, 2000). Where significant differences were found, follow-up tests were conducted to evaluate pairwise differences among the means. Partial eta squared (η_p^2) was used to calculate effect size since it reflects the proportion of variance in satisfaction scores that may be attributable to the grouping variables, self-efficacy and self-regulation (Huberty, 1994). However, Olejnik and Algina (2003) cautioned that effect size measures will differ depending upon the research design used.

Research Question 3

An independent samples *t* test was used for comparing experienced computer users with novice users to determine if satisfaction was the same. *T* tests are appropriate when the researcher's statistical focus is on one or two means (Huck, 2000; Hurlburt, 1998). When sample sizes are less than 30 participants, Gall et al. (2003) recommended the *t* test for accurate measurements of statistical significance. Prior computer experience has been shown to effect students' satisfaction in a computer-based learning environment, particularly for novice computer users (Debowski et al., 2001; Huang, 2002). Without the requisite computer skills, students are unable to take advantage of instructional tools for completing educational activities

and collaborative learning processes (Harasim, 1999). Therefore, it was important to account for the effect this variable may have had on students' satisfaction.

Research Question 4

Throughout the semester, data was collected on the actual number of student postings observed on bulletin boards and in chat rooms. In addition, structural features of discussions, e.g., threaded discussions, original posts, and the total number of postings was accumulated. The unit of analysis used was a message or post since it could be objectively identified and it was manageable (Rourke et al., 2000). Currently any robust methodology for measuring student interactions and examining how online discussions effect satisfaction is nonexistent.

Interaction has been acknowledged as one of the most important aspects of learning in traditional and distance education environments (Jung et al., 2002; Picciano, 2002). Communicative interactions allow students to receive feedback from their teacher about their performance and it encourages them to participate in active learning by sharing their opinions or asking questions (Prammanee, 2003). Research literature regarding the importance of interaction in online distance education courses is extensive and has supported the concept that learner to teacher and learner-to-learner interactions are important elements in the design of an online course. Typically, students report increased satisfaction in online courses depending on the quality and quantity of interactions (Fredericksen et al., 1999; Picciano, 2002; Richardson & Swan, 2003; Rosenkrans, 2001; Valenta, Therriault, Dieter, & Mrtek, 2001). The majority of research into CMC has relied on content analysis and has primarily focused on the quality of messages. Henri's (1992) work developed the framework for an analytical model to measure five dimensions of the learning process externalized in online messages: (a) participation, (b) interaction, (c) social, (d) cognitive, and (e) metacognitive dimensions. Unfortunately, this type

of analysis is subjective, complex, and time-consuming since classification methods and coding schemes are widely varied (Fahy et al., 2001; Henri, 1992; Stemler, 2001). A more systematic approach for examining computer-conferencing technologies is needed in order to understand the flow and sequence of messages (Jeong, 2003).

Recent studies have made the distinction between students' social presence and interaction as it relates to students satisfaction in online courses (Picciano, 2002; Richardson & Swan, 2003). Interaction in online distance education is defined as "two-event sequences composed of a given message and target message (or responding message)" (Jeong, 2003, p. 29). In online communication, the numbers of responses to original posts signifies interactive messages and are strong indicators that participation is taking place. Interactive messages include references to an original topic and to other messages through responses, elaboration, or further development of a topic's contents (Henri, 1992). Using the reply feature to post messages, quoting from conference transcript, and referring to others' messages are all types of interactive responses (Rourke et al., 1999). In threaded discussions, messages are hierarchically organized into threads and responses are displayed in subheadings. Each message that is threaded or linked forms a unit of interaction for sequential analysis (Edelstein & Edwards, 2002; Jeong, 2003). Threaded discussions are a constructive measure of a course since they mirror real classroom discussions (Riva, 2001; Riva & Galimberti, 1997). By calculating the number of messages with replies and total replies to each message, patterns of interaction become discernable. One of the benefits of online learning is that it is possible to track learner and instructor written contributions to determine whether postings initiate a discussion thread or are in response to a previous posting. In an attempt to standardize each student's participation, a participation-

interactivity score was calculated on an individual basis as follows:

$$PI = R_i * AI$$

The total number of messages that received at least one replying message (R_i) multiplied by each participant's activity index (*AI*) represented a measure of participation interactivity (*PI*). The total number of replies that student's messages generated were divided by the sample's total replies and multiplied by 10 to determine activity index (*AI*). Bulletin board discussions were compiled into text files, imported into Excel®, and spreadsheets were used to identify and track links between messages in discussion threads.

Another calculation was performed in an effort to determine the extent of students' presence in online discussions. Presence is defined as the ability of students to project themselves in a community of learners (Rourke et al., 1999). Presence, in an online course, refers to students' sense of belonging and their effectiveness in interacting with other students even though face-to-face contact is not available (Gunawardena & Zittle, 1997; Picciano, 2002). In order to participate successfully, students must learn to adjust to the nonlinear asynchronous character of online learning. With face-to-face interactions, discussions are linear and similar in nature to a single discussion thread. When students participate by posting an original topic, they are either posting to inform or to solicit a response. In essence, they are projecting themselves socially into a community of learners (Aviv, 2000; Bernard et al., 2000; Conrad, 2002; Garrison et al., 2001; Haythornthwaite et al., 2000; J. Hill & Raven, 2000; McDonald, 2002; Rourke et al., 1999). To determine social presence, total postings were tracked as a gauge of students' presence and as an indicator of the degree to which everyone was acknowledged within the group (Fahy et al., 2001). Computing the total number of postings provides an effective method for monitoring

online activity (Poscente, 2002; Rosenkrans, 2001). The following formula was developed as a standard measure of each student's participation presence:

$$PP = R_p * DI$$

The total number of postings represents the raw score for students' presence in an online course (R_p). The word count for each student's postings were divided by the total sample's word count and multiplied by 10 to determine density index (*DI*). Since the denominator for total word count can be quite large, it is necessary to use a unit of measure that facilitates comparisons. There are various methods for defining density in online classroom discussions. Several researchers have tried to compute density ratings for a sample of students by dividing total postings by total word counts or total lines per posting divided by total lines in the sample (Fahy et al., 2001; Gabriel, 2000; Lipponen, Marjaana, Lallimo, & Hakkarinen, 2001; Rourke et al., 2000). However, this does not take into effect students that may post frequently but not write much, or students that post infrequently but are very verbose. The total word count on its own is not a sufficient determinant of students' participation in an online classroom. Instead, it is necessary to compare word count measures to total postings in order to capture a representative snapshot of each student's presence.

Next, a frequency distribution based upon each student's total participation score was constructed. From the distribution, upper, middle, and lower class boundaries were distinguished. Levels of participation were based upon these three categories. An ANOVA was conducted to verify whether significant differences existed between high, medium, and low participation groups with respect to satisfaction. A one-way ANOVA was used because it measures whether one or more components of a multiple level independent variable (participation) predict the value

of a dependent variable (satisfaction; Maxwell & Delaney, 2000). Descriptive statistics and word counts using spreadsheet formulas were also generated.

Research Question 5

Question 5 asked for comparative information when students were grouped according to gender, male or female. Research literature suggests that gender can account for variability that occurs in students' overall perception of their social presence and perceived learning with their online educational experience (Fredericksen et al., 1999; Richardson & Swan, 2003). It also suggests that gender is an important factor in students' self-regulated learning strategies and self-efficacy (Bandura, 1989; Hargis, 2000; Pajares, 2002; Pintrich & De Groot, 1990). However, there lacks prior research that addresses gender differences with respect to satisfaction in online courses (Merisotis & Phipps, 1999).

Data analysis of the groups by gender consisted of an independent samples *t* test, which is typically used when the researcher's statistical focus is on one or two means (Huck, 2000).When sample sizes are less than 30 participants, Gall, et al. (2003) recommend the *t* test for accurate measurements of statistical significance.

Summary

Data collected from the two questionnaires were input into the Statistical Package for the Social Sciences (SPSS) database, version 11.5. Initially, descriptive statistics were analyzed to determine if there are any data entry errors. Additionally, descriptive statistics were generated to examine participant scores for satisfaction among the different levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender.

In order to answer three of the research questions pertaining to self-efficacy, self-regulated learning strategies, and participation, a series of one-way ANOVA procedures were

computed using students' satisfaction as the dependent variable. This was because a small sample size was anticipated. The other two research questions regarding prior computer experience and gender were analyzed using independent samples *t* tests. The level of significance for evaluating all of the sample evidence was set at .05. This is considered a conservative method for controlling for Type I error (chances of rejecting a true null hypothesis) (Huck, 2000). A summary of data analysis and instruments used is provided in Table 5.

Table 5

Data Analysis and Instrumentation

Variable Name	Research Question and Data Analysis	Instrumentation
Independent variable #1:	How did students' satisfaction differ with respect to their level of self-efficacy in an online distance education course?	Online self-efficacy and learning strategies survey;
Self-efficacy	Descriptive statistics; Frequency distributions; One-way ANOVA	Items #14-32
Independent variable #2:	How did students' satisfaction differ with respect to their level of self-regulated learning strategies in an online distance education course?	Online self-efficacy and learning strategies survey;
Self-regulated learning strategies	Descriptive statistics; Frequency distributions; One-way ANOVA	Items #1-31 *Final Section*
Independent variable #3:	How did students' satisfaction differ with respect to their level of prior computer experience in an online distance education course?	Online self-efficacy and learning strategies survey;
Prior computer experience	Descriptive statistics; Frequency distributions; Independent samples *t* test	Items #1-13
Independent variable #4:	How did students' satisfaction differ with respect to their level of participation in an online distance education course?	Structural elements of bulletin board discussions
Participation	Descriptive statistics; Frequency distributions; One-way ANOVA	
Independent variable #5:	How did students' satisfaction differ with respect to their gender in an online distance education course?	Satisfaction survey;
Gender	Descriptive statistics; Independent samples *t* test	Item #5

CHAPTER 4

FINDINGS

The purpose of this study was to examine the effect of levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender on satisfaction among graduate and undergraduate students enrolled in online distance education courses. To achieve this, a review of literature, creation and modification of survey instruments, analysis of text-based bulletin board discussions, validation procedures, and final survey administration were conducted.

The first portion of this study developed a set of validated online self-efficacy, self-regulated learning strategies, prior computer experience, and satisfaction questionnaire items. A six-step process was used that included (a) a review of the literature to locate items to support the constructs of self-efficacy, user computer experience, and satisfaction, (b) item categorization and instrument construction, (c) instrument modification, (d) panel review, (e) consensus group processing, and (f) pilot testing. This process yielded two survey instruments. The first instrumentation process produced six items for measuring students' computer experience, 19 items for measuring online self-efficacy, and 31 items from the modification of an existing instrument measuring self-regulated learning strategies. The second instrument design procedures resulted in 17 items for determining students' satisfaction, the dependent variable. Outcomes from the six-step process, the surveys, were presented in Chapter 3. Findings from final administration of pilot-tested instruments are presented here.

Students who were enrolled in two different asynchronous online distance education courses at a major university were questioned in the process. The first survey instrument developed measured prior computer experience, self-efficacy, and self-regulated learning strategies. Items measuring self-regulated learning strategies were a modified version of Motivated Learning Strategies Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeachie (1991). The second instrument collected information regarding student's satisfaction, the dependent variable, with their online course experience.

Respondent Characteristics

In developing a profile of students' characteristics in online distance education courses, it was essential to collect demographic data pertinent to satisfaction with their courses. Due to the concerns raised by Phipps and Merisotis (1999) regarding deficiencies in educational comparative studies, each online course was analyzed separately. As of May 5, 2004, 15 usable questionnaires were completed online for a response rate of 83% for the business education dual-level course (S_1). There were 11 questionnaires completed online for a response rate of 37% for the instructional technology class (S_2). Since there was one individual who sent an e-mail stating he/she did not want to participate, the response rate for Sample S_2 was calculated by the following formula (De Vaus, 2002):

Response rate = [Number returned / *N* in sample – (ineligible + unreachable)] x 100

The total in the sample, represented by *N*, was equal to 31 for S_1, and 18 for S_2.

Sample S_1 Online Course

All students in this sample were education majors (100%). Thirteen of 15 students were females (87%) ranging in age from 19 to 51 years (M = 25, SD = 2) as of their last birthday. Most respondents indicated they were full-time students (73%) and were taking from 12 to 18

semester hours. One individual had previously taken five online courses. At least 67% indicated that they had never taken an online distance education course. Three students indicated they had participated in only one online course (20%), whereas one individual had taken two (6%). Five students were graduate-level with a bachelor's as their highest degree completed (33%), while the remaining 10 (67%) were undergraduates. Except for one student, the majority indicated they owned a computer (93%) and had access to one when not at school or work.

Sample S_2 Online Course

Excluding one individual, most students in this sample were education majors (91%). All 11 students were females (100%) ranging in age from 22 to 54 years (M = 38, SD = 3) as of their last birthday. Two students (18%) were considered full-time and were enrolled in four courses. One student was carrying one course (9%); six were enrolled in two courses (55%), whereas two were taking three courses (18%). Three students (27%) indicated they had never had an online distance education course. Fifty-five percent noted that they had taken one online course previously, one individual had three online courses, and one had four. Nine students (82%) held a bachelor's as their highest degree while, two (18%) had a master's. All of the students in the sample stated they owned a computer (100%) and had access to one when they were not in school or at work. For Sample S_2, all students that had taken one online course (55%) were enrolled in their first online course the prior semester. Five of the eleven students (45%) that completed the study were participants in the pilot the prior semester. Therefore, almost half were familiar with the instruments. A correlation between the scores for students that completed both surveys twice was computed for prior computer experience, self-efficacy, and learning strategies. The students' mean scores for the first time they took the surveys was 10.85 (SD = .65). For

those students that took the surveys a second time, their mean scores combined were 11.38 (*SD* = .93). The correlation between the scores was .95 indicating responses were consistent both times.

Self-Efficacy

The first objective was to determine the effect of levels of self-efficacy on students' satisfaction in an online distance education course. Self-efficacy was one of five classification variables in this study. Self-efficacy scores were based upon students' confidence in using online Web-course tools. From the results of the pilot study, instrument validation, and reliability determination, four subscales were identified: (a) Internet performance expectations, (b) asynchronous performance expectations – bulletin board, (c) asynchronous performance expectations – e-mail, and (d) synchronous performance expectations. For each of the subscales, 19 items were rated on a 5-point Likert-type scale from 1 (*not at all confident*) to 5 (a*lways confident*). The total scores for online self-efficacy ranged from 1 to 5 and were calculated by averaging the total scores for this section of the questionnaire. Each student's individual scores for self-efficacy were then trifurcated into groups that were labeled high, medium, and low 33rd percentiles. Higher scores indicated greater levels of online self-efficacy. The importance of identifying students' strengths and weaknesses early in a program is related to success and satisfaction in online classrooms (Miller, Rainer, & Corley, 2003; Miltiadou & Chong, 2001). If students are technologically proficient, research shows they are more efficacious and have a better experience when participating online (Bernard et al., 2000; Chang, 2000).

Using the statistical software SPSS®, frequency distributions were calculated to interpret and compare raw scores. These scores were subsequently trifurcated into high, medium, and low groups (33rd percentiles). Table 6 provides a summary of online self-efficacy scores, frequencies, and percentage of individuals grouped by levels of efficaciousness for Sample S_1.

Table 6

Sample S_1—Description of Online Self-Efficacy Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Internet performance expectations:			
Level 1 (4.25-4.75)	4	26.7	26.7
Level 2 (4.88)	5	33.3	60.0
Level 3 (5.00)	6	40.0	100.0
Total	15	100.0	
Mean = 4.82; SD = .23; Median = 4.87; Range = 4.25-5.00			
Asynchronous performance expectations:			
Bulletin Board:			
Level 1 (3.25-3.75)	5	33.3	33.3
Level 2 (4.00-4.50)	4	26.7	60.0
Level 3 (5.00)	6	40.0	100.0
Total	15	100.0	
Mean = 4.28; SD = .69; Median = 4.25; Range = 3.25-5.00			
E-mail:			
Level 1 (3.75-4.75)	5	33.3	33.3
Level 2 (5.00)	10	66.7	100.0
Total	15	100.0	
Mean = 4.68; SD = .51; Median = 5.00; Range = 3.75-5.00			
Synchronous performance expectations:			
Level 1 (2.00-3.33)	5	33.3	33.3
Level 2 (4.00-4.67)	3	20.0	53.3
Level 3 (5.00)	7	46.7	100.0
Total	15	100.0	
Mean = 4.09; SD = 1.07; Median = 4.67; Range = 2.00-5.00			
Overall Self-efficacy scores:			
Level 1 (3.70-4.40)	5	33.3	33.3
Level 2 (4.60-4.70)	3	20.0	53.3
Level 3 (4.90-5.00)	7	46.7	100.0
	15	100.0	
Mean = 4.53; SD = .44; Median = 4.60; Range = 3.70-5.00			

Table 7 provides a similar summary for S_2. The mean of overall scores for the measure of online self-efficacy was 4.53 (*SD* = .44) for S_1 and 4.47 (*SD* = .39) for S_2. For Internet performance expectations (8 items), the mean was 4.82 (*SD* = .23) for S_1 and 4.83 (*SD* = .30) for S_2. For asynchronous performance expectations, bulletin board usage (4 items), the mean was 4.28 (*SD* = .69) for S_1 and 4.11 (*SD* = .90) for S_2. For asynchronous performance expectations, e-mail usage (4 items), the mean was 4.68 (*SD* = .51) for S_1 and 4.54 (*SD* = .59) for S_2. Finally, synchronous performance expectations (3 items) had a mean of 4.09 (*SD* = 1.07) for S_1 and 4.27 (*SD* = .63) for S_2. Internal consistency reliabilities (Cronbach's alpha) using this data set were as follows: Internet performance expectations, *r* = .78; asynchronous performance expectations, bulletin board, *r* = .92; asynchronous performance expectations, e-mail, *r* = .82; and synchronous performance expectations, *r* = .94. The coefficient alpha for overall online self-efficacy was .89.

The data was analyzed using a one-way analysis of variance (ANOVA). The independent variable, online self-efficacy, included three levels: low self-efficacy (Level 1), medium self-efficacy (Level 2), and high self-efficacy (Level 3). The dependent variable was the satisfaction scores reported by the participants. The results of ANOVAs for each sample showed no statistical significance at the .05 level: S_1, $F(2, 12) = .60$, $p = .563$, $\eta_p^2 = .09$; S_2, $F(2, 8) = 1.42$, $p = .297$, $\eta_p^2 = .26$. Partial eta squared is represented by η_p^2. The test of homogeneity of variance was nonsignificant, $p = .771$ for S_1, however, it was significant for S_2, $p = .009$. Since there is a lack of power associated with this test due to the small sample sizes (S_1 observed power = .13; S_2 = .22), the results of the homogeneity tests do not necessarily imply that there are differences in the population variances. The strength of the relationship between the levels of self-efficacy and satisfaction scores, as assessed by η_p^2, was not as strong for S_1 as it was for S_2. Sample S_1

Table 7

Sample S_2–Description of Online Self-Efficacy Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Internet performance expectations			
Level 1 (4.00-4.71)	3	27.3	27.3
Level 2 (4.86)	2	18.2	45.5
Level 3 (5.00)	6	54.5	100.0
Total	11	100.0	
Mean = 4.83; SD = .30; Median = 5.00; Range = 4.00–5.00			
Asynchronous performance expectations:			
Bulletin Board:			
Level 1 (2.50-3.50)	3	27.3	27.3
Level 2 (4.00-4.50)	4	36.4	63.6
Level 3 (5.00)	4	36.4	100.0
Total	11	100.0	
Mean = 4.11; SD = .90; Median = 4.00; Range = 2.50-5.00			
E-mail:			
Level 1 (3.25-4.25)	3	27.3	27.3
Level 2 (4.50-4.75)	3	27.3	54.5
Level 3 (5.00)	5	45.5	100.0
Total	11	100.0	
Mean = 4.54; SD = .59; Median = 4.76; Range = 3.25-5.00			
Synchronous performance expectations:			
Level 1 (3.00-3.67)	2	18.2	18.2
Level 2 (4.00-4.33)	5	45.5	63.6
Level 3 (4.67-5.00)	4	36.4	100.0
Total	11	100.0	
Mean = 4.27; SD = .63; Median = 4.33; Range = 3.00-5.00			
Overall Self-efficacy scores:			
Level 1 (3.70-4.20)	3	27.3	27.3
Level 2 (4.30-4.50)	3	27.3	54.5
Level 3 (4.60-5.00)	5	45.5	100.0
Total	11	100.0	
Mean = 4.47; SD = .39; Median = 4.50; Range = 3.70-5.00			

accounted for only 9% of the variance of the dependent variable, whereas Sample S_2 accounted for 26% of the variance. Table 8 presents the relevant descriptive statistics for each sample.

Table 8

Samples S_1 & S_2 Means and Standard Deviations of Online Satisfaction Survey Scores per Level of Online Self-Efficacy

Online Satisfaction Survey Scores						
	Sample S_1			Sample S_2		
Level of Online Self-efficacy	N	Mean	SD	N	Mean	SD
Level 1 - Low self-efficacy	5	2.99	.47	3	2.63	1.41
Level 2 – Medium self-efficacy	3	3.37	.59	3	3.41	.46
Level 3 – High self-efficacy	7	3.23	.50	5	3.56	.35

As can be seen from these analyses, though there was no statistical significance, the direction of change in mean satisfaction scores was what would be expected. For each sample, low levels of self-efficacy were associated with low satisfaction scores. Likewise, high levels of self-efficacy were related to higher satisfaction scores. An exception was noted for S_1 in that the mean scores for medium self-efficacy was only slightly higher than the mean scores for higher levels. Implications are discussed further in Chapter 5.

Self-Regulated Learning Strategies

The second research objective was to determine the effect of levels of self-regulated learning strategies on students' satisfaction in an online distance education course. Subscales from a modified version of the Motivated Strategies for Learning Questionnaire (MSLQ) were used to assess students' levels of self-regulated learning (Pintrich et al., 1991). The original

MSLQ used a 7-point Likert-type scale while the revised version used only five points. The response choices for this study were revised to read as follows: 1 (*not at all true of me*), 2 (*rarely true of me*), 3 (*sometimes true of me*), 4 (o*ften true of me*), and 5 (*always true of me*).

Before complete analysis of the data could take place, individual MSLQ scale scores had to be combined into a single composite score that could subsequently be used to determine each student's level of self-regulation. These scores were then trifurcated into high, medium, and low (33rd percentiles). The greater the score, the higher the level of self-regulated learning strategies. Self-regulated learning strategies are an important means for self-directing students' learning when they have to study by themselves in distance education courses (Hargis, 2000; Joo et al., 2000; King, 2001; Winne, 1995a). Research shows that highly self-regulated students are more satisfied with their online course experience (Bernard et al., 2000; O'Hanlon, 2001).

The original MSLQ has 15 subscales that can be used together or individually. The metacognitive self-regulations and resource management subscales containing 31 items were used for this study. These subscales were selected because they test for those self-regulatory strategies that might be applicable in an online distance education environment (Corno & Mandinach, 1983). The five subscales related to self-regulated learning strategies are: (a) metacognitive self-regulation, (b) time and study environment, (c) effort regulation, (d) peer learning, and (e) help seeking.

With the use of SPSS® software, raw scores from frequency distributions were trifurcated into high, medium, and low categories (33rd percentiles). Table 9 provides a summary of self-regulated learning strategies (SRLS) scores, frequencies, and percentages of individuals grouped by levels of self-regulation for Sample S_1. Table 10 provides a comparable summary for S_2. The mean of overall scores for the measure of SRLS was 3.14 (*SD* = .53) for S_1 and 3.53 (*SD* = .51)

Table 9

Sample S_1—Description of SRLS Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Metacognitive self-regulation:			
Level 1 (2.25-2.58)	5	33.3	33.3
Level 2 (2.75-3.42)	4	26.7	60.0
Level 3 (3.67-4.08)	6	40.0	100.0
Total	15	100.0	
Mean = 3.08; SD = .62; Median = 2.83; Range = 2.25-4.08 (from 1 to 5)			
Time and study environment:			
Level 1 (2.63-3.25)	4	26.7	26.7
Level 2 (3.38-3.75)	5	33.3	60.0
Level 3 (4.00-4.88)	6	40.0	100.0
Total	15	100.0	
Mean = 3.72; SD = .61; Median = 3.62; Range = 2.63-4.88 (from 1 to 5)			
Effort regulation:			
Level 1 (2.50-3.25)	4	26.7	26.7
Level 2 (3.50-4.00)	3	20.0	46.7
Level 3 (4.25-5.00)	8	53.3	100.0
Total	15	100.0	
Mean = 3.83; SD = .69; Median = 4.00; Range = 2.50-5.00 (from 1 to 5)			
Peer learning:			
Level 1 (1.00-1.33)	5	33.3	33.3
Level 2 (1.67-2.33)	3	20.0	53.3
Level 3 (2.67-4.00)	7	46.7	100.0
Total	15	100.0	
Mean = 2.13; SD = .97; Median = 2.00; Range = 1.00-4.00 (from 1 to 5)			
Help seeking:			
Level 1 (1.00-2.00)	5	33.3	33.3
Level 2 (2.25-2.75)	5	33.3	66.7
Level 3 (3.25-3.75)	5	33.3	100.0
Total	15	100.0	
Mean = 2.50; SD = .79; Median = 2.50; Range = 1.00-3.75 (from 1 to 5)			

Table 9 *(continued)*

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Overall Self-regulated learning strategies scores:			
Level 1 (2.30-2.90)	5	33.3	33.3
Level 2 (3.00-3.40)	5	33.3	66.7
Level 3 (3.50-4.10)	5	33.3	100.0
Total	15	100.0	
Mean = 3.14; SD = .53; Median = 3.10; Range = 2.30-4.10 (from 1 to 5)			

Table 10

Sample S_2–Description of SRLS Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Metacognitive self-regulation;			
Level 1 (2.67-2.83)	3	27.3	27.3
Level 2 (3.08-3.58)	4	36.4	63.6
Level 3 (3.67-4.33)	4	36.4	100.0
Total	11	100.0	
Mean = 3.40; SD = .53; Median = 3.50; Range = 2.67-4.33 (from 1 to 5)			
Time and study environment:			
Level 1 (3.00-3.13)	3	27.3	27.3
Level 2 (3.38-4.14)	4	36.4	63.6
Level 3 (4.25-5.00)	4	36.4	100.0
Total	11	100.0	
Mean = 3.93; SD = .71; Median = 4.12; Range = 3.00-5.00 (from 1 to 5)			
Effort regulation:			
Level 1 (3.50-4.00)	4	36.4	36.4
Level 2 (4.25)	3	27.3	63.6
Level 3 (4.50-4.75)	4	36.4	100.0
Total	11	100.0	
Mean = 4.20; SD = .37; Median = 4.25; Range = 3.50-4.75 (from 1 to 5)			

Table 10 *(continued)*

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Peer learning:			
Level 1 (1.67-2.00)	2	18.2	18.2
Level 2 (2.67-3.00)	5	45.5	63.6
Level 3 (3.33-3.67)	4	36.4	100.0
Total	11	100.0	
Mean = 2.85; SD = .64; Median = 2.67; Range = 1.67-3.67 (from 1 to 5)			
Help seeking:			
Level 1 (2.25-2.75)	3	27.3	27.3
Level 2 (3.25)	3	27.3	54.5
Level 3 (3.50-4.50)	5	45.5	100.0
Total	11	100.0	
Mean = 3.27; SD = .62; Median = 3.25; Range = 2.25-4.50 (from 1 to 5)			
Overall Self-regulated learning strategies scores:			
Level 1 (2.70-3.00)	3	27.3	27.3
Level 2 (3.40-3.70)	4	36.4	63.6
Level 3 (3.74-4.20)	4	36.4	100.0
Total	11	100.0	
Mean = 3.53; SD = .51; Median = 3.60; Range = 2.70-4.20 (from 1 to 5)			

for S_2. The subscale, peer learning, had the lowest scores for S_1 (M = 2.13, SD = .97) and for S_2 (M = 2.85, SD = .64). Overall SRLS scores were lower for S_1 (M = 3.14, SD = .53) than for S_2 (M = 3.53, SD = .51). Students scored the highest on time and study environment (M = 3.72, SD = .61; M = 3.93, SD = .71) and effort regulation (M = 3.83, SD = .69; M = 4.20, SD = .37) for S_1 and S_2 respectively. For the metacognitive self-regulation subscale, two out of 12 items (17%) were reversed scored. Time and study environment had three out of eight (37%) reversed-scored items, effort regulation had two out of four (50%), and peer learning had none. Only one item was missed in the SRLS section. This occurred within Sample S_2's time and study environment subscale, a reverse-scored item. The mean replacement method using SPSS® was applied to replace the missing data (De Vaus, 2002). The coefficient alpha for overall self-regulated learning strategies with the revised scales and some wording modifications (as noted in Chapter 3) was .92 (N = 26). Cronbach's alpha for internal reliability for the data set was as follows: metacognitive self-regulation (12 items), r = .83; time and study environment (8 items), r = .85; effort regulation (4 items), r = .58; peer learning (3 items), r = .78; and help seeking (4 items), r = .65.

The data was analyzed using a one-way ANOVA. The independent variable self-regulated learning strategies (SRLS) included three levels: (a) low SRLS (Level 1), (b) medium SRLS (Level 2), and (c) high SRLS (Level 3). The dependent variable was the satisfaction scores evidenced by participants. The test of homogeneity of variance was significant for Sample S_2, p =.007 but nonsignificant for S_1, p = .737. However, due to the small sample size, the results of the homogeneity tests do not necessarily mean that there were differences in the population variances. The results of the ANOVA for S_1 were statistically significant at the .05 level, $F(2, 12) = 5.77$, p = .018, η_p^2 = .49. Sample S_2's ANOVA results were not statistically significant,

$F(2, 8) = 2.56$, $p = .138$, $\eta_p^2 = .39$. The observed power for S_1 was .77 and for S_2 was .37. The strength of the relationship between the levels of SRLS and satisfaction scores, as assessed by η_p^2, indicated that at least 49% of the variance of the dependent variable was accounted for in S_1, and 39% was accounted for in S_2.

Since the results were statistically significant indicating that the three populations differed in levels of SRLS for S_1, a Bonferroni contrast test analysis was used to evaluate pairwise differences among the means. The analysis revealed that Levels 2 (medium SRLS, $p = .045$) and 3 (high SRLS, $p = .031$) were significantly different than Level 1 (low SRLS) on satisfaction outcomes. The results indicated that low SRLS seemed to produce low satisfaction scores. Table 11 presents a recap of the relevant descriptive statistics for each sample.

Table 11

S_1 & S_2 Means and Standard Deviations of Online Satisfaction Survey Scores per Level of SRLS

Online Satisfaction Survey Scores						
	Sample S_1			Sample S_2		
Level of Self-regulated Learning Strategies (SRLS)	N	Mean	SD	N	Mean	SD
Level 1 - Low SRLS	5	2.71	.32	3	2.53	1.34
Level 2 – Medium SRLS	5	3.39	.43	4	3.34	.32
Level 3 – High SRLS	5	3.43	.49	4	3.75	.22

Prior Computer Experience

In order to address the third objective, prior computer experience was grouped into two broad categories, novice and expert, based upon a literature review and the six-step instrument validation process. Wells (2000) research into students' online experience, in addition to other

studies, identified the importance of computer skills in relation to their satisfaction in an online distance education course (Chang, 2000; Chen, 2002; Delcourt & Kinzie, 1993; Easton & LaRose, 2000; McManus, 2000; Miller et al., 2003; Osika & Sharp, 2002).

Participants rated each item according to how well the statement described them. A 4-point Likert-type scale was used with the following scale category descriptions: 1 (*none*), 2 (*beginner*), 3 (*competent*), and 4 (*expert*). Every item was a positive question that characterized different aspects of an online interface, e.g., "Prior to taking this course, what was your level of experience with word processing (create, edit, save, print documents)?" Respondents reported their level of expertise on four different computer experience categories: (a) word processing, (b) presentation software, (c) navigating the Web, and (d) using e-mail. Scores for prior computer experience were calculated by summing the score for the six items in this section of the questionnaire and taking the average. Possible scores for prior computer experience could range from 1 to 4. The higher the score, the greater the level of computer experience.

Debowski, Wood, and Bandura (2001) used the term novice to describe students with basic competencies in performing self-guided electronic searches. Wells (2000) categorized levels of prior computer experience in relation to stages of concern based on nine categories ranging from zero (low) experience to expert (high) users. There was no data furnished for reliability for these studies.

Similar to the previous independent variables in this study using SPSS®, scores were bifurcated (50^{th} percentiles), based upon frequency distributions, into high and low groups. Table 12 provides summaries of prior computer experience scores, frequencies, and percentages of individuals grouped by levels of experience for Samples S_1 and S_2. The mean of overall scores for the measure of prior computer experience was 3.43 (SD = .33) for S_1 and 3.30 (SD = .43) for

S_2. Cronbach's alpha for internal reliability for the data set was .72. One observed reason for the low alpha for prior computer experience was the small number of items used to measure this construct.

Table 12

S_1 & S_2 Description of Prior Computer Experience Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Sample S_1:			
Level 1 (2.67-3.33)	8	53.3	53.3
Level 2 (3.50-3.83)	7	46.7	100.0
Total	15	100.0	
Mean = 3.43; SD = .33; Median = 3.33; Range = 2.67-3.83 (from 1 to 4)			
Sample S_2:			
Level 1 (2.50-3.33)	5	45.5	45.5
Level 2 (3.50-3.83)	6	54.5	100.0
Total	11	100.0	
Mean = 3.30; SD = .43; Median = 3.50; Range = 2.50-3.83 (from 1 to 4)			

The data was analyzed using an independent samples *t* test. The independent variable, prior computer experience, included two levels: novice and expert. Novice users were categorized as Level 1 and expert users Level 2. The dependent variable was the student's score on the satisfaction survey. Levene's test for variance equality indicated that at the .05 level the variances among the populations were equal, $F = 1.33$, $p = .269$ (S_1); $F = 2.99$, $p = .118$ (S_2). Therefore, the assumption of homoscedasticity was met. The results of the independent samples *t* tests were not statistically significant at the .05 level, $t\ (13) = -2.06$, $p = .060$, $\eta_p^2 = .24$ for Sample S_1 and $t\ (9) = -1.52$, $p = .162$, $\eta_p^2 = .20$ for S_2. The mean amount of students' satisfaction in the expert group ($M = 3.43$, $SD = .51$; $M = 3.59$, $SD = .32$) was greater than the mean for

students in the novice group (M = 2.95, SD = .37; M = 2.88, SD = 1.09), Samples S_1 and S_2 respectively. The partial eta square (η_p^2) index indicated that 24% and 20% (Samples S_1 and S_2, respectively) of the variance of the satisfaction variable was accounted for by amount of prior computer experience. In addition, a .95 confidence interval for the difference in the population means was computed to equal (-.99, .02) for S_1 and (-1.75, .34) for S_2. Table 13 presents the relevant descriptive statistics for each sample.

Table 13

S_1 & S_2 Means and Standard Deviations of Online Satisfaction Survey Scores per Level of Prior Computer Experience

Online Satisfaction Survey Scores						
	Sample S_1			Sample S_2		
Level of Prior Computer Experience	N	Mean	SD	N	Mean	SD
Level 1 - Novice	8	2.95	.37	5	2.88	1.09
Level 2 – Expert	7	3.43	.51	6	3.59	.32

Participation

The fourth objective was to determine the effect of levels of participation on students' satisfaction in an online distance education course. Participation was another one of the five classification variables in the study. Participation scores were based upon students' participation-interactivity (PI) and participation-presence (PP). To determine interactivity, data was collected on the actual number of student postings to the online discussion board. Each message was examined individually to establish if that message had a reply and if so, the total number of replies. Each student's reply total was divided by the sample total to determine an activity index

(AI). Then, total messages with replies per student were multiplied by AI to obtain a PI score. Sequential posts are an indication of the development of discussion threads. An example of a threaded bulletin board discussion is provided in Figure 1 to illustrate how replies are linked to each original posting. Messages are hierarchically organized into threads and related responses are shown in subheadings. Every message and response are threaded or linked to form a unit of interaction. Some replies represented responses to another's reply initiated by an original post from someone else, and so on. Any personal identifying features have been removed to maintain confidentiality.

Figure 1. Sample bulletin board threaded discussion.

Next, data on students' presence was gathered. Total word counts of each student's postings were computed. Those totals were divided by the sample total to determine a density index (DI). Then, total postings per student were multiplied by DI to obtain a PP score.

To establish the relationship between students' participation and their satisfaction with their online course experience, the satisfaction survey administered to students contained

questions that addressed presence and interactivity (see Appendix E). Subscales were identified to focus on the quality of their learning experience, teacher interaction, and classmate interaction. Ten items in the questionnaire pertained to teacher interaction, Items 6 through 15, and Items 16 through 20 supported classmate interaction.

In pursuing the effect of students' participation on their satisfaction scores on the survey, the data on participation was sorted by the total PI and PP scores for each individual. Using SPSS®, scores were trifurcated, based upon frequency distributions, into high, moderate, and low levels (33rd percentiles). Tables 14 and 15 provide summaries of participation scores, frequencies, and percentages of individuals grouped by levels of participation for Samples S_1 and S_2. The mean of overall scores for the measure of participation interactivity (PI) for S_1 was 7.23 (*SD* = 6.07) and for S_2 was 11.99 (*SD* = 19.99). For participation presence (PP), the mean of overall scores for S_1 was 14.05 (*SD* = 4.05) and for S_2 was 25.96 (*SD* = 45.16). The average word count was considerably larger for S_1 (3,423) than for S_2 (1,223). Cronbach's alpha for internal reliability for the data set (r = .83) was adequate for PP and PI.

The data was analyzed using a one-way analysis of variance (ANOVA). The independent variable, participation, included three levels (33rd percentiles): (a) low participation, (b) moderate participation, and (c) high participation. The dependent variable was the satisfaction scores exhibited from students. The results of the ANOVAs for each sample showed no statistical significance at the .05 level. S_1, $F(2, 12) = .18$, $p = .834$, $\eta_p^2 = .03$; S_2, $F(2, 8) = 2.26$, $p = .167$, $\eta_p^2 = .36$. Levene's test of homogeneity of variance was nonsignificant for both Samples S_1 and S_2, .68 and .07 respectively. The strength of the relationship between levels of participation and satisfaction scores, as assessed by η_p^2, was not as strong for S_1 as it was for S_2. Sample S_1 accounted for 3% of the variance of the dependent variable, whereas S_2 accounted for 36% of the

Table 14

Sample S_1—Description of Participation Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Participation interactivity (PI):			
Level 1 (01.00-03.20)	5	33.3	33.3
Level 2 (04.16-07.20)	5	33.4	66.7
Level 3 (09.60-23.40)	5	33.3	100.0
Total	15	100.0	
Mean = 7.23; SD = 6.07; Median = 6.16; Range = 1.00-23.40			
Participation presence (PP):			
Level 1 (06.62-11.89)	5	33.3	33.3
Level 2 (12.95-15.87)	5	33.4	66.7
Level 3 (16.53-20.87)	5	33.3	100.0
Total	15	100.0	
Mean = 14.05; SD = 4.05; Median = 14.26; Range = 6.62-20.87			

Table 15

Sample S_2—Description of Participation Construct and Sample Distribution

Construct/Levels	Frequency	Percent of Cases	Cumulative Percent
Participation interactivity (PI):			
Level 1 (00.87-02.85)	3	27.3	27.3
Level 2 (03.49-05.58)	4	36.3	63.6
Level 3 (06.28-69.77)	4	36.4	100.0
Total	11	100.0	
Mean = 11.99; SD = 19.99; Median = 4.71; Range = 00.87-69.77			
Participation presence (PP):			
Level 1 (01.76-03.78)	3	27.3	27.3
Level 2 (05.91-14.51)	4	36.3	63.6
Level 3 (21.85-158.84)	4	36.4	100.0
Total	11	100.0	
Mean = 25.96; SD = 45.16; Median = 12.28; Range = 1.76-158.84			

variance. Table 16 presents the relevant descriptive statistics for each sample. The overall conclusion was that actual student interaction as measured by the number of postings (PP) and interactivity (PI) had no relationship to satisfaction scores. In S_2, students with high participation levels scored higher in satisfaction than lower or moderate levels of participation. However, in S_1 the low participation group scored the highest.

Table 16

S_1 & S_2 Means and Standard Deviations of Satisfaction Survey Scores per Level of Participation

Online Satisfaction Survey Scores						
	Sample S_1			Sample S_2		
Level of Total Participation	N	Mean	SD	N	Mean	SD
Level 1 – Low participation	5	3.28	.49	3	3.41	.27
Level 2 – Moderate participation	5	3.08	.38	4	2.68	1.14
Level 3 – High participation	5	3.16	.65	4	3.75	.22

Figures 2 and 3 more effectively portray the relation of raw data for individual students in each sample. The percentage of total postings that represented messages with at least one reply was 45% for S_1 and 47% for S_2. The average word count for S_1 was 3,423 words compared to 1,223 words per student for S_2. A major difference between the groups existed in that posting to the bulletin board was a requirement for Sample S_1; however S_2's use was limited to collaborative projects. In addition, S_1's participation accounted for 84% of the class total, whereas for S_2 only 33% was accounted for by the sample population.

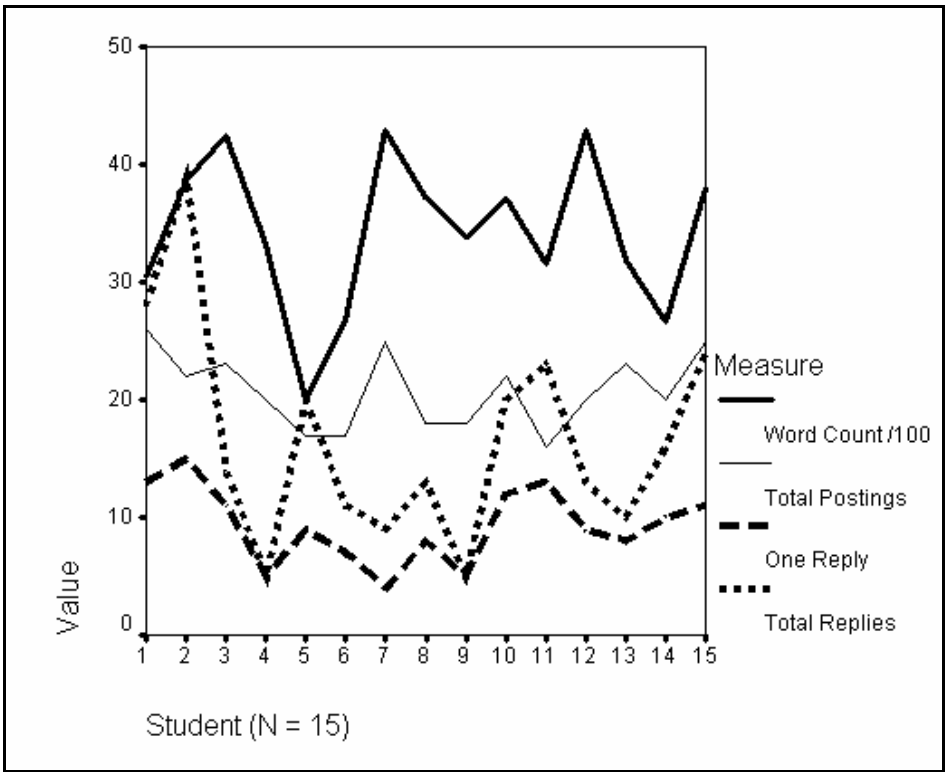

Figure 2. Sample S_1 raw data of student's measure of participation in discussions.

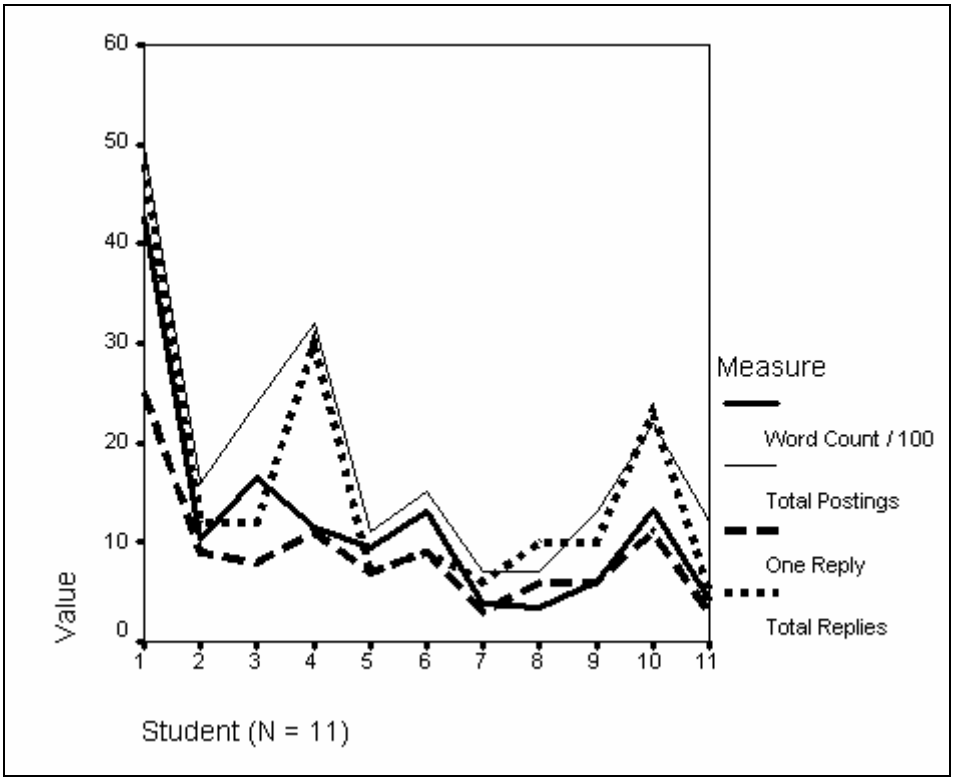

Figure 3. Sample S_2 raw data of student's measure of participation in discussions.

Gender

The fifth and final objective was to determine the effect of gender on students' satisfaction in an online course. According to Merisotis and Phipps (1999), one of the shortcomings in current research is the lack of investigation of gender as a characteristic of profiles of student learners in online distance education courses. Bandura (1989) posited that after an individual assumes his/her gender role, "What follows is the development of educational, occupational, avocational, and social competencies [which are] motivated intrapsychically by a drive to match one's gender conception" (p. 38). Gender is a basic consideration in distance education courses since it represents a dimension that effects satisfaction with an online learning experience (Arbaugh, 2001; Fredericksen et al., 1999; Huang, 2002; Joo et al., 2000; McElhatton, 2002; Pintrich & De Groot, 1990; Richardson & Swan, 2003; Spiceland & Hawkins, 2002; S. Wang, 1994).

Of the 15 students in Sample S_1 indicating their gender, 13 (87%) were female and two (13%) were male. All 11 (100%) participants for Sample S_2 were females. A *t* test for independent groups was used to test differences in mean satisfaction scores for the two groups in S_1. The test was not statistically significant at the .05 level, $t\ (13) = 0.62$, $p = .545$, $\eta_p^2 = .03$. Levene's test for variance equality indicated that at the .05 level the variances among the populations were equal, $F = .09$, $p = .764$. A similar comparison could not be made for S_2 since all of the participants belonged to one group. The overall mean for females in S_2 was 3.19 (SD = .82). The η_p^2 index for S_1 indicated that 3% of the variance of the satisfaction variable was accounted for by whether a student was male or female. In addition, a .95 confidence interval for the difference in the population means was computed to equal (-.589, 1.064) for S_1. On average,

the mean scores for males' satisfaction were slightly higher (*M* = 3.38, *SD* = .46) than for females (*M* = 3.14, *SD* = .51). Table 17 presents the descriptive statistics for each sample.

Table 17

S_1 & S_2 Means and Standard Deviations of Satisfaction Survey Scores per Gender

Online Satisfaction Survey Scores						
	Sample S_1			Sample S_2		
Gender	N	Mean	SD	N	Mean	SD
Male	2	3.38	.46	–	–	–
Female	13	3.14	.51	11	3.19	.82

CHAPTER 5

DISCUSSION

The objective of this study was to contribute to the understanding of levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender and their affect on students' satisfaction in a college online distance education course. This chapter consists of five sections that present an interpretation of the results. With the first section, the rationale and theoretical framework provide a context for interpretation of results. The next section restates the purpose and objectives of this study followed by a section that recaps the methods used. The fourth section comments on the study's findings, results, and implications for future research. The final section addresses contributions of the study in the area of students' learning strategies in online distance education courses.

Rationale and Theoretical Framework

The influence on education played by earlier technologies such as radio and television did not have as much an impact as the World Wide Web (WWW) has currently had on higher education. Arguably, educators were unable to adequately face up to the challenge of developing meaningful programs for these earlier forms of media (Buckland & Dye, 1991; Kriger, 2001). Despite these former shortcomings, response by educators to the WWW has been different. Online distance education is growing and as a result, educational institutions are changing (Phipps & Merisotis, 2000). The question is how these changes will influence students' satisfaction in a new classroom environment that is technologically driven.

To determine whether the WWW has had an effect on learning outcomes and students' attitudes, several comparative studies have been performed (Carrell & Menzel, 2001; Diaz, 2000; Halsne & Gatta, 2002; Hargis, 2000; Heckman & Annabi, 2003; S. Johnson, 2001; McElhatton, 2002; Saba, 1998; Sankaran & Bui, 2001; Swan & Jackman, 2000; Tucker, 2001; A. Wang & Newlin, 2000; Wegner et al., 1999). In fact, the debate remains ongoing and hotly contested, i.e. are online distance education classrooms as effective as traditional ones? What is more, are certain technologies only good for certain types of educational settings, different disciplines, or learning goals? Do comparative studies provide the whole picture and are they useful in determining the appropriateness of the WWW for online distance education (G. Brown & Wack, 1999; Schutte, 1996)? Russell (1999) certainly insinuated as much with the compilation of an annotated bibliography of over 355 studies that claimed there was no significant difference between traditional and technologically mediated instruction in online distance education. What Russell failed to point out is that many of these studies lacked sufficient power in that sample sizes were small, methodology was sketchy at best, instructional methods were different for each class, and disparities existed between learning objectives. Merisotis and Phipps (1999), in their extensive review of the literature, determined that much of the no significant findings were based upon, "opinion pieces, how-to articles, and second-hand reports that don't include original research with subjects (students or faculty) who are being studied" (para. 5). Particularly with respect to students' satisfaction with online distance learning, the quality of original research was considered "questionable" at best (para. 9).

In an attempt to avoid questionable comparisons, this study incorporated more complicated relationships and concepts with the expectation of expanding understandings of what effects students' satisfaction in online distance education. In online distance education,

researchers have focused on satisfaction because they believed that students' attitude toward technology affects their learning and use of computers. Prior research indicated a positive relationship between computer experience and satisfaction toward distance learning (Debowski et al., 2001; Fredericksen et al., 1999; Huang, 2002). Other studies also showed some combination of self-efficacy, self-regulated learning strategies, and participation as being associated with students' satisfaction toward computer technology (Bernard et al., 2000; Fredericksen et al., 1999; Gunawardena & Zittle, 1997; Jung et al., 2002; Loomis, 2000; McLoughlin & Luca, 2002; O'Hanlon, 2001; Richardson & Swan, 2003; Rosenkrans, 2001; Wegner et al., 1999; Wolfe, 2001). However, no research study actively investigated all of the aspects concurrently that were indicative of a complete profile of students' characteristics with a successful experience in an online distance education setting. As Merisotis and Phipps put it in their report for the Institute for Higher Education Policy (1999), more studies are needed in an attempt to formulate a composite of all of these features including gender, age, and educational experience in online learning courses. Besides, according to them, the focus should be on the appropriateness of a particular model for specific learning goals; not whether that model compared favorably with another.

Based upon a review of the literature, the interpretation of this study's results is directed by the general thought of whether levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender effected satisfaction among students enrolled in online distance education courses (Bernard et al., 2000; Debowski et al., 2001; Schunk & Zimmerman, 1997; Wolfe, 2001). This study's assumption was that higher technology proficiency leads to more satisfaction in online experiences. Likewise, with higher self-efficacy and self-regulated learning strategies, students will accomplish their learning tasks more

efficiently, persistently, and have more positive attitudes toward their online courses (Bandura, 1986; Chang, 2000; McLoughlin & Luca, 2002). Participation in online discussions will equally contribute to students' satisfaction to the extent that it will encourage interaction with the instructor and other students. The last conjecture was that an investigation of gender will determine if there is a difference between preferences for learning situations.

Failures of education can be attributable to a variety of factors. In fact, Reeves (1997) argued that pedagogical aspects warrant researchers' investigations rather than scrutinizing technical mediums used in the delivery process in computer-mediated courses. Others concur and are emphatic that factors crucial to the cognitive development of students' learning resulting in a positive attitude toward their online learning experience should be scrutinized (Bernard et al., 2000; Huang, 2002; Jung et al., 2002; McLoughlin & Luca, 2002; O'Hanlon, 2001; Picciano, 2002; Rosenkrans, 2001; Sims et al., 2002). Since the validity of comparative studies has been questionable and has produced conflicting outcomes, it makes more sense to evaluate each course based upon individual characteristics rather than trying to interpret differences between traditional and Web-based classrooms (Merisotis, 1999; Merisotis & Phipps, 1999). At issue and must ultimately be determined is whether online distance education should duplicate traditional classrooms or if different guidelines should be enforced to ensure quality education and successful learning experiences for students that only come face-to-face with each other and their instructor in a virtual environment. The most effective method of doing that is to develop a comprehensive profile of students' characteristics and to focus on the medium *and* the way it has been used in instruction (Clark, 1994; Harasim et al., 1997; Kozma, 1994a, 1994b; Petrides, 2002). To satisfy the concerns posited by Phipps and Merisotis (1999) regarding the limitations

of comparative studies, each sample used in this study was analyzed separately with only cautionary conclusions based on an individual course's distinctive setting.

There are numerous studies that have emphasized the importance of self-efficacy and self-regulation for students' satisfaction in distance education (Bernard et al., 2000; Eom & Reiser, 2000; King, 2001; McLoughlin & Luca, 2002; O'Hanlon, 2001). These studies established that lack of confidence can negatively influence students' desire, impede cognitive development, and discourage participation in collaborative projects. According to Bandura's (1989, 1993, 1994, 1997, 2001) extensive research into self-efficacy beliefs, most knowledge is socially informed and information is gained from exploratory experiences. Basically, there are three kinds of causal influences in knowledge formation: (a) behavior, (b) cognitive and personal factors, (c) and environmental influences operating interactively in a triadic reciprocal relationship (Bandura, 1986; Zimmerman, 1989). Figure 4 presents a schematic of the three determinants in Bandura's triadic reciprocity.

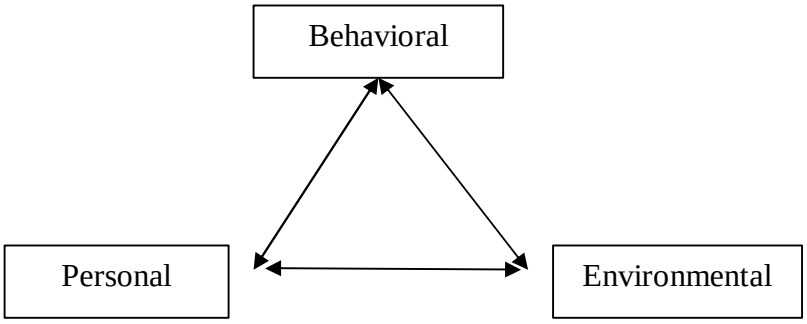

Figure 4. Bandura's (1986) schematic of the three determinants of triadic reciprocality.

Students' confidence relies on their abilities to perform based upon the knowledge and skills they have developed so far. Therefore, their successful performance in an online distance education class should have a direct reciprocal effect on their self-efficacy perceptions (Bandura, 1993, 1994, 1997; Bandura & Locke, 2003; Browne, 2001; T. Hill et al., 1987; Zimmerman,

1989). The conceptualization of online self-efficacy should include mastery of Web-course tools needed for the attainment of subskills that will help students feel they can successfully accomplish Internet-related tasks (Delcourt & Kinzie, 1993). Going online requires navigating the WWW, establishing a stable Internet connection, accessing resources for relevant information, preparing and posting documents, e-mailing, and using File Transfer Protocol (FTP) (Osika & Sharp, 2002). Once they overcome any doubts about performance, students with high levels of self-efficacy in remote computing settings will be more productive and satisfied (Arbaugh, 2000; Rosenkrans, 2001). What is needed is an instrument that will properly reflect the construct of self-efficacy in an online environment. In an effort to understand what comprises students' characteristics, this study builds on past research to develop a new measure of online self-efficacy. The questionnaire that was developed was designed to assess reliability and analyze the construct validity of online self-efficacy. Although the instrument measures specific task performances, namely ones inherent in interacting with a technological interface that uses WebCT, it manages to reflect all of the skills necessary for operationalizing self-efficacy in a way that is consistent with its conceptual definition. In fact, self-efficacy is supposed to be situational specific in that to understand its influences on certain behaviors, a particular activity domain should be measured rather than relying on large-scale global assessments (Bandura, 1991a, 1997).

The importance of self-regulation in influencing students' satisfaction in online distance education has been demonstrated in previous research (Chen, 2002; Hargis, 2000; Joo et al., 2000; King, 2001; O'Hanlon, 2001; Tam, 2000; Wolfe, 2001). Self-regulation is not a mental aptitude or academic performance skill. Instead, it is a self-directive process whereby learners transform their mental abilities into academic proficiency (Zimmerman, 1989, 1995, 1998,

2002). Individual learners are responsible for initiating, conducting, and controlling the learning process (Moore, 1994) Particularly in an online distance education setting, metacognitive self-regulation and the use of learning strategies are essential when learning is non-linear and multidimensional (Dede & Palumbo, 1991; Vrasidas, 2002). In actuality, many of the factors that predicted success for distance learners using earlier methods, such as correspondence or interactive video, remain relevant to satisfaction and students' success in online distance education (Tallman, 1994). The assumption is that higher levels of self-regulated learning strategies will lead to more satisfaction and students will be able to successfully monitor their own learning. Otherwise, students that experience difficulty in transitioning to self-directed asynchronous learning environments will not be as satisfied and will be less inclined to take another online course (Hargis, 2000). As such, there was a need to identify if students have the capability of learning by way of technology (Moan & Dereshiwsky, 2002).

The Internet requires a set of skills that to the novice user may be intimidating. The relationship of self-efficacy and prior computer experience is understandable since self-efficacy is necessary for overcoming any fears novice users might undergo in online classes (Pietsch, 2003). Research indicated that students with high levels of self-efficacy were more productive and satisfied in distance learning situations (Chang, 2000). It would then make sense, especially if students were going to embrace computer technologies and have confidence in using computers that prior experience would tend to help in any situation. However, previous studies were inconclusive on the effects of levels of prior computer experience and satisfaction in an online course (Fredericksen et al., 1999; Wells, 2000). Since results were not clear, it was necessary to try to determine if prior computer knowledge was pertinent in remote distance education settings that revolve around Internet technology.

The WWW's ability to sustain interaction and collaborative work is an important aspect in distance education (Hillman et al., 1994). The changes from computer technology resulted in the formation of new interactive methods of engagement referred to as computer-mediated communication (CMC) and computer supported collaborative work (CSCW; Riva, 2001; Riva & Galimberti, 1997). A new social space has been created, termed cyberspace, where students can gain a sense of self and assume new roles in their online intellectual interactions (Czubaj, 2000; Dede & Palumbo, 1991; Riva & Galimberti, 1997).

The increase in online distance education courses is due in part to the unprecedented amount of interaction that can occur between teachers and students with these new technologies. In many ways, the same interaction that occurs in a traditional classroom can be replicated in an online one (Arsham, 2002). Even more remarkable is that interactions can occur between students or teachers located in other parts of the world. What needs to be determined by educators is the best way to manage the content so that feedback is informative and positively influences interaction (Nguyen & Kira, 2000; Olcott, 1999). It is essential that learning environments create a conversational framework that facilitates students' satisfaction and understanding in online distance education classes. Instructors need to know whether a specific amount of time participating in online discussions will lead to favorable attitudes toward their course experience (Miller et al., 2003). To further their understanding, they also need to know which type of interaction is effective for increasing satisfaction, i.e., do students' participate more in learner-to-learner interaction, learner-to-teacher interaction, or learner-to-content interaction (Moore, 1989). Previous studies have shown that social presence, the degree to which a student participates in online discussions, is a strong indicator of satisfaction in CMC (Gunawardena & Zittle, 1997; Richardson & Swan, 2003; Rourke et al., 1999). By providing

reliable, standardized formulas for quantifying students' presence and interactivity in discussion postings, this study sought to discover if CMC was an advantage to students in connecting with other students and the instructor. Moreover, it tried to determine if increased participation resulted in a favorable instructional experience.

Although the effects of learning strategies, participation, and prior computer experience are interesting, including gender as a variable will help provide a more comprehensive explanation of learners' attitudes toward online distance education. After all, women and disabled individuals were excluded from taking correspondence courses when they were initially offered in the United States (Watkins & Wright, 1991) Understanding the obstacles that exist for females especially with regard to technology related areas, provides insight into differences in the manner in which males and females communicate (Stewart et al., 1999). Online education can be a great equalizer especially for women or other minority populations, since only the content of their contribution is being assessed, and not their looks or appearance. Therefore, online distance education may provide a more desirable learning environment for females. The significance of gender with respect to online classes has been indecisive (B. Brown & Liedholm, 2002; T. Hill et al., 1987; Stewart et al., 1999). To understand these differences, it was necessary to investigate the effect of gender on students' satisfaction in evaluating online courses in order to identify the sources of problems or successes and suggest possible improvements in the future.

Since distance education covers forms of study that are not under the constant continuous supervision of teachers in the same place-based classroom as their students but still benefit from the guidance of an educational institution, Bandura's (1986) social cognitive theory and Moore's (1973) theory of distance education with respect to transactional distance provided the best theoretical framework for this study. Constructivism provided the basis for a learning model that

corresponded to the role of learner as an active one in online distance education settings (Diaz, 2000; Jaramillo, 1996). Social cognitive theory offered explanations for self-regulated learning strategies, self-efficacy, and prior computer experience in relation to students' satisfaction. Transactional distance proffered a conceptualization of computer-mediated communication and students' methods of participation that used computers to encourage interactivity.

Bandura's (1986) social cognitive theory was based in part on Vygotsky's Zone of Proximal Development (1978), whereby cognitive development was limited to a specific time span and social interaction played a fundamental role in the development of cognition. In effect, the learner must experience concepts and socially negotiate their significance in the context of his or her learning environment. Students learn through interactions with their peers, teacher, and the contextual setting. Perceived self-efficacy operates as an important contributor to students' success in a classroom (Bandura, 1993). Students' beliefs in their efficacy to regulate their own learning and to master academic activities determine their goals, motivational levels, and academic accomplishments. Self-efficacy was defined as personal beliefs about students' abilities to learn or perform at designated levels (Bandura, 1986, 1994, 1997). It also served as the arbitrator of social influences and self-regulating processes (Schunk, 1990; Schunk & Zimmerman, 1997). Self-regulated learners are aware of what they know, what they deem important, and can plan to handle the interplay between these when they take on a task. Furthermore, they know when to seek and retrieve information; they can monitor their success in relation to their goals, and can adjust or abandon their goals accordingly (Winne, 1995a, 1995b). The social cognitive aspect of self-regulated learning contains a triadic reciprocal process that includes self-observation, self-judgment, and self-reaction (Zimmerman, 1989). Depending upon the degree that self-efficacy and self-regulation are present, students are able to take

responsibility for their own learning and relish their independence, which in turn will influence the extent of their satisfaction in attaining their goals (Holmberg, 1989; Liu & Ginther, 1999; M. Moore, 1973, 1994).

Transactional distance was part of M. Moore's (1991) theory of distance education and originates from Dewey (Dewey & Bentley, 1949). Moore's theory recognized the difference between interactions that occur in face-to-face classrooms and classrooms where the student and teacher are physically separated. Moore maintained that learning and teaching behaviors in a distance education class are considered a function of dialogue and structure. The relative characteristics of transactional distance means that it can be difficult for some learners to project themselves socially in a text-based environment where the nature of interaction is dependent on computer technology (Lally & Barrett, 1999; Rourke et al., 1999). Therefore, dialogue is important for students' when they need help in resolving a difficult conceptual problem. Through observing dialogue in a bulletin board or chat room discussion, students can also learn vicariously (Miltiadou & Savenye, 2003). Moreover, discussions between the instructor and students or just between students are permanent and can be viewed and contemplated at any time. This allows lurkers or silent students to benefit from reading others' contributions (Stenning et al., 1999).

Although transactional distance can exist in a traditional face-to-face classroom, in distance education the physical separation between student and teacher that requires the use of unusual techniques for instruction is the component that sets courses at a distance apart from regular educational programs (Saba, 1988). The character of transactional distance determines the method of exchanging information in online distance education classes. Subsequently, students can interact with each other, the teacher, or the content (Huang, 2002). It is through the

interaction process that students' perception of their online experience results in a satisfactory experience or, in some cases, turns into a disappointing one. Certainly, a closer inspection of bulletin board discussions in an online distance education class can provide important information on how students engage and whether they feel their communication is productive.

Purpose and Objectives

It follows that the purpose of this study was to examine the effect of levels of self-efficacy, self-regulated learning strategies, participation, prior computer experience, and gender on satisfaction among university students enrolled in online distance education courses. This study contributes to an understanding of learner characteristics that results in satisfactory experiences in an online learning environment. Providing this information will offer additional insight into the differences *among* individual courses rather than comparing the differences *between* disparate online classes without carelessly lumping them into one "average" category.

The specific objectives for accomplishing the purpose of this study were:

1. Determine how students' satisfaction differed with respect to their level of self-efficacy in an online distance education course.

2. Determine how students' satisfaction differed with respect to their level of self-regulated learning strategies in an online distance education course.

3. Determine how students' satisfaction differed with respect to their level of prior computer experience in an online distance education course.

4. Determine how students' satisfaction differed with respect to their level of participation in an online distance education course.

5. Determine how students' satisfaction differed with respect to their gender in an online distance education course.

Method

In the first phase of this study, an online self-efficacy and learning strategies survey along with a satisfaction survey were developed. A set of 25 items were constructed to measure prior-computer experience and online self-efficacy. An additional set of 31 items were modified from an existing questionnaire, Motivated Strategies for Learning Questionnair*e* (Pintrich et al., 1991). Including six items to address demographics and one open-ended question, the online self-efficacy and learning strategies survey consisted of 64 items in all. The online satisfaction survey contained 23 items. A review of the literature determined identifying behaviors to measure each construct. Panel review, consensus group processing, followed by pilot testing the instruments were used to establish validity and reliability. Finally, the revised instruments were utilized in the final phase of the study and were administered to undergraduate and graduate students who were enrolled in online distance education courses in the college of education at a major southeastern university. In addition, data was collected on the number of students' postings observed on bulletin boards along with annotating certain structural features of online discussions to determine levels of participation.

Sample

The samples for this study were samples of convenience and the students involved volunteered to participate. Fifteen students enrolled in an online business education (Sample S_1) dual-level course participated in the study. An additional eleven students registered in a graduate-level instructional technology (Sample S_2) online class also participated. The number of participants was not sufficient for the total sample size necessary (N = 66), which was calculated by a computer program, for three levels of comparison using an analysis of variance for the desired degree of power, effect size, and significance level (Borenstein et al., 2000).

Of the students in Sample S_1 that participated, 13 were female and two were male. The majority was 19 to 24 years old (66%), 26% were in the 25 to 36 year old range, and one individual was in their fifties. Eighty-one percent of the participants were currently enrolled in three or less courses and were considered part-time students. Slightly over 86% had previously taken only one online course or had never taken any. Sixty-six percent of the students were undergraduates whereas the remaining 33% held a bachelor's degree. Fourteen out of 15 owned a computer and had access to one while they were not at school or work. One hundred percent of participants were education majors.

Of the students from Sample S_2 that participated, 100% were female. Thirty-six percent were under 30 years of age, while another 36% ranged in age from 37 to 48 years. Twenty-eight percent were over 49 years of age. Seventy-three percent were enrolled in four or more classes and were considered full-time students. Eighty-one percent had never previously taken an online course or had only completed one. One hundred percent of the students were graduates. All, except for one, were education majors. One hundred percent also owned a computer or had access to one while not at school or work.

Measures

Indicators as to the level of prior computer experience, self-efficacy, self-regulated learning strategies, and gender were gathered from an online self-efficacy and learning strategies survey created for this study. These were conceptualized as four independent variables. The first seven items of the survey gathered gender, demographic information to determine age, number of online courses taken, course load, and whether they owned a computer or had access to one. The items measuring prior computer experience consisted of six items using a 4-point Likert-type scale with 1 indicating no experience to 4 indicating an expert level of competence. Possible

scores ranged from 1 to 4. The items measuring online self-efficacy contained 19 questions pertaining to students' level of confidence using Web-course tools in online classes, e.g., electronic mails (e-mails), chat sessions, and bulletin board discussions. Online self-efficacy was scored on a 5-point Likert-type scale with item response options including 1 (*not at all confident*), 2 (*rarely confident*), 3 (*sometimes confident*), 4 (*often confident*), and 5 (*always confident*). Possible scores ranged from 1 to 5. In each case, the higher the score, the higher the level of computer experience and self-efficacy. For prior computer experience, scores were bifurcated into two levels: novice and expert (50^{th} percentiles). For self-efficacy, scores were trifurcated into three levels: low, medium, and high (33^{rd} percentiles).

The final section of the online self-efficacy and learning strategies survey measured students' ability to self-regulate their learning. Indicators were gathered from sections of the Motivated Strategies for Learning Questionnaire (Pintrich et al., 1991). The MSLQ was based upon two broad sections, i.e., cognitive view of motivation and learning strategies. Self-regulated learning strategies were conceptualized based upon five out of fifteen possible scales representing the learning strategies section: (a) metacognitive self-regulation, (b) time and study environment, (c) effort regulation, (d) peer learning, and (e) help seeking. In addition, the original questionnaire used a 7-point Likert-type scale ranging from 1 (*not at all true of me*) to 7 (*very true of me*). The revised scales used five points beginning with 1 (*not at all true of me*), 2 (*rarely true of me*), 3 (*sometimes true of me*), 4 (*often true of me*) to 5 (*always true of me*). Total scores could range from 1 to 5. Final scores were trifurcated into three levels of self-regulation: high, medium, and low (33^{rd} percentiles).

Participation was measured using data collected on the actual number of students' postings to each online discussion board for their class. Participation scores were developed

based upon students' participation-interactivity (PI) and participation-presence (PP) scores combined. To determine the PI score, each message was examined to establish if it had a reply and if so, the total number of replies were tallied. The total number of messages with replies was multiplied by an activity index (AI) to calculate a PI score per participant. Activity index was based upon each student's total replies received per message divided by the sample's total and multiplied by 10. To determine a student's PP score, total postings per student were multiplied by a density index (DI) calculation. Density index was based upon each student's total word count divided by the sample's total word count and multiplied by 10. Scores on participation were sorted by the total PI and PP scores for each individual. Scores were then trifurcated into low, moderate, and high levels (33^{rd} percentiles) of participation that ranged from 11.95 to 39.93 for Sample S_1 and from 3.07 to 228.61 for Sample S_2.

Finally, measures for the dependent variable, satisfaction, were based upon total scores from a self-report questionnaire that examined the impact of the degree of support, connectedness, and peer feedback students received in their online distance education course. The online satisfaction survey had 23 items total divided into three separate subscales: (a) teacher interaction, (b) classmate interaction, and (c) technical support. The survey was constructed with one stem followed by a list of different types of interaction experiences students would likely encounter with chat room discussions, bulletin board discussions, feedback from their peers, and from their instructor. According to their level of satisfaction with each item, students self-selected from a scale ranging from 1 (*very unsatisfied*), 2 (*unsatisfied*), 3(s*atisfied),* to 4 (*very satisfied*). Scores ranged from 1 to 4 with higher scores indicating more satisfaction. The survey was not designed to measure how participants felt about the course or the material

covered; instead, it was intended to measure their perception of their experiences with the instructor and other classmates in an online distance education environment.

Procedures

Once the instruments were developed and the panel review and consensus group processing was completed, approval was granted from the university's Institutional Review Board (IRB) to conduct the study. A pilot study was conducted from November through December 2003. After the validation process, the two instruments, online self-efficacy and learning strategies and online satisfaction surveys, were administered to participants enrolled in online distance education courses who volunteered to take part in the study. For the final study, data was collected from the period January through May 2004. All students were given instructions on how to access the Web site where the online surveys were posted. In addition, e-mails were sent to each student emphasizing the importance of the study and the optional feature to participate. Thirty-two e-mails were sent to students enrolled in an instructional technology online course. An additional 20 e-mails were sent to students in a business education online course informing them that the surveys were available over the Internet. Moreover, instructors emphasized that participation was not a requirement and that all information would remain confidential. To further reduce response bias, an incentive drawing for a $100 gift certificate was offered. Additional efforts included sending three follow-up e-mails as reminders to nonresponders. The fact that online discussions would be analyzed for quantitative purposes was also disclosed. The entire period for all data collection was six months.

At the end of the data collection period, a total of 15 or 83% of the sample population completed both surveys for Sample S_1. For Sample S_2, a total of 11 or 37% completed them. To check for respondent bias, a wave analysis was conducted comparing early to late responders.

Comparison of the four wave analyses of responses determined that response bias was a concern for S_2, however it was not for S_1.

Data Analysis

During the first phase of the study, a set of instruments were constructed to measure self-efficacy, self-regulated learning strategies, prior computer experience, and satisfaction. A review of the literature located items to support the individual constructs followed by item categorization. The online self-efficacy and learning strategies survey and the satisfaction survey were constructed, passed through panel review, consensus group processing, and pilot testing to produce a final set of descriptors. The first instrument produced six items for measuring students' computer experience, 19 items for measuring online self-efficacy, and 31 items for measuring self-regulated learning strategies. The second instrument produced 17 items for measuring students' satisfaction, the dependent variable. In addition to instrument construction, structural features of online bulletin board discussions were analyzed to determine levels of participation.

The first analysis performed in this study tested the reliability of the instruments. Reliability coefficients for internal consistency were calculated from the sample data (n = 26) for each variable as well as their subscales. Transformations of independent variable data into categories was made with the use of descriptive statistical values and frequency distributions, resulting in reasonably equivalent groups. In addition to the five independent variables, questions in the demographic section of the surveys were analyzed by frequency and percentage, and were used for conceptualizing students' characteristics.

To test assumptions for conducting analysis of variance (ANOVA), each group's mean difference was compared to test for homogeneity of variance. Next, a series of ANOVA and

independent sample *t* test procedures at the .05 level of significance were computed for the dependent variable, which was the overall satisfaction score. The independent variables were level of self-regulation, self-efficacy, prior computer experience, participation, and gender. Finally, items revealed by the one-way ANOVA to be statistically significant were subjected to Bonferroni's post hoc analyses to further identify group differences.

Results, Discussions, and Implications

There are four important points to note before discussing results and implications of this study. The first item is related to sample size. Since each class that participated in the study was examined separately, the small sample sizes from the two courses that participated in the final study ($N_1 = 15$, $N_2 = 11$) limited the statistical probability of detecting small differences (Olejnik, 1984). The software program, *Power and Precision* (Borenstein et al., 2000), estimated that based on a large effect size and a level of significance of .05, 22 students per level would be needed to detect significant differences with a power of .82. As Rushen (1995) aptly puts it, with tongue in cheek, a large effect size would not be able to detect live students from dead ones in a classroom. In this study, it is reasonable to assume that a larger sample size would minimize sampling error, and would increase statistical power. However, Phipps and Merisotis (1999) felt that demonstrating significant differences between groups of different learners did not take into account that learners exhibit many different characteristics and that comparing the two is not as helpful as focusing on individual group differences.

Moreover, the sample selection could not be randomized. This can be problematic, particularly with intact groups of students enrolled in college-level courses. Therefore, this study's comparisons were based on characteristics of participants rather than on random assignment of individuals to groups. It was also practical to assume that gender differences (87%

female in S_1 and 100% female in S_2) had some effect on the outcome. In addition, participants were groups of individuals seeking degrees in education. These participants may differ in terms of other students taking online distance education classes at other institutions. The course specializations in this study are not necessarily representative of other online courses and include a narrow range of topics limited to instructional technology and business education. Results of this study may not be used to explain student satisfaction in other online distance education courses.

The most critical point is that a single end-of-course survey cannot prove causality. Implications are that measures of students' satisfaction cannot really be used to determine if they enjoyed the cognitive aspects of the course. Due to the lack of a real criterion to judge the knowledge gained from activities, assessments, and collaborative projects, it was impossible to ascertain if students enjoyed the process of their online experience from their learning or from other motivational factors. A study that measured satisfaction followed by an objective measure of learning would have contributed much more toward establishing the causal relationship among self-efficacy, self-regulated learning strategies, prior computer experience, participation, and gender. However, due to sample size limitations, group differences would have been impossible to detect.

There were other problems encountered, namely in securing consent from instructors to take part in this study. It took at least a year to locate instructors who would agree to have their online conversations monitored. The main deterrent were ethical considerations that could arise by not making it clear whether the participants knew they were being monitored or how issues of managing and collecting online conversations would be handled (Brem, 2002). Given the nature of online discussions, the procedures for anonymizing information posed additional concerns to

everyone involved. Not only were students' conversations subjected to scrutiny; but the instructors' were, too. As a result, I had limited access to students' participation data.

The interface used for online distance education courses for this study was WebCT. WebCT provides several built-in functions that help instructors determine how many times a page has been accessed, total time students spend on a page, average time spent per visit, and number of discussion postings made to a page. In addition, it tracks the date a student first accessed WebCT, last access date, number of times each student logged on, number of items read, and number of postings. However, this data was not made available to me. My access was limited to a student's status, and as such, I had to develop methods for tracking voluminous amounts of discussion postings and determine the structure of responses for each student individually. In fact, for one course in the pilot study, students interacted primarily through e-mail with the instructor. This resulted in minimal activity on bulletin board discussions, e.g., only seven postings in all. Since e-mail communications were private, it was impossible to establish how many students participated in the course or their level of interaction, which subsequently resulted in precluding them from the study's findings.

Self-Efficacy

Discussion of results. The first research objective was to determine how students' satisfaction differed with respect to their level of self-efficacy in an online distance education course. Participants rated each of the 19 items related to self-efficacy from the online self-efficacy and learning strategies survey according to the extent of their level of confidence in using Web-course tools on a 5-point Likert scale from 1 (*not at all confident*) to 5 (*always confident*). Higher scores indicated students were more efficacious in manipulating computers in an online distance education class. Reliability coefficients for internal consistency for the 26

students that participated in the study were calculated for each subscale: (a) Internet performance expectations (r = .78), (b) asynchronous performance expectations–bulletin board (r = .92), (c) asynchronous performance expectations–e-mail (r = .82), and (d) synchronous performance expectations (r = .94). The overall alpha coefficient, r = .89, indicated the scale had sufficient homogeneity (Huck, 2000).

Based upon students' self-efficacy scores and frequency distributions, the scores were trifurcated into top, middle, and bottom categories (33rd percentiles). Each group was then labeled: 1 = low, 2 = medium, and 3 = high. Scores were evenly distributed for each level within each subscale. However, for the e-mail use subscale, because all of the students in S_1 scored 3.75 or higher, the level assigned to participants understated their actual ranking, i.e., these students were assigned to low and medium levels because of frequency percentages even though their scores were more indicative of high levels of self-efficacy. It would have been beneficial to create weighted composite scores, however due to the extremely small group sizes, this was not considered useful. The differences hypothesized in satisfaction between a low, medium, and high level of self-efficacy were not supported by the data.

Although the results from analysis of variance showed no statistical significance at the .05 level (S_1, p = .563; S_2, p = .297), the mean score for low self-efficacy (M_1 = 2.99, M_2 = 2.63; Samples S_1 and S_2 respectively) was lower than the mean score for satisfaction in the high self-efficacy group (M_1 = 3.23, M_2 = 3.56). The literature review stated students with higher levels of self-efficacy would be more satisfied with their online course experience. Even though no statistically significant differences were detected between levels, with a larger sample size results may have been more conclusive.

Implications for practice and research. The lack of statistically significant differences was not surprising given the small sample sizes for this study ($N_1 = 15$, $N_2 = 11$). Since the overall reliability coefficient was .89, considered an acceptable level, the items measuring self-efficacy were useful for making instructional decisions when developing online distance education courses (Yu, 2001).

Self-efficacy determines the attempts at performance and the persistence in completing a task (Corno & Mandinach, 1983). By determining students' attitudes about their ability to accomplish a task with Web-based tools, instructors will be able to decide if additional training is necessary for enhancing students' technological skills. Identifying measures will play a valuable role in students' attaining and successfully completing their course objectives.

The importance of distinguishing general and task-specific self-efficacy has been discussed and is expected to be an important issue in distance education courses (Bandura, 1993, 1994, 1997). Although instrument items addressed the conceptual definition of online self-efficacy and the use of Web-course tools, Bandura (1986) and Pajares (1996) maintained that an effectual assessment should evaluate specific skills and target the precise psychological domain. As Choi, Fuqua, and Griffin (2001) stated, "To understand how self-efficacy relates to various psychological and educational outcomes of importance across a variety of domains, it is necessary to have available instruments that tap disparate domains and provide valid and reliable scores" (p. 488). The instrument items identified for this study will be helpful for deciding which services need to be made available to students to help them function more efficiently in an online course with computer technologies. Students need to perceive themselves as confident in managing their learning and coming to terms with new technologies.

Another factor to consider, when looking at the results, is that most of these students (93% to 100%) owned their own computer. This could very well be the reason that many of them scored above 3.25 out of a possible 5.00 for online self-efficacy. Except for synchronous performance expectations, scores were as low as 2.00 for S_1, most of the scores were high for each of the subscales. In fact, the online self-efficacy mean scores for both samples were M_1 = 4.53 and M_2 = 4.47. Of further note is all participants were female except for two male students in S_1. However, the implications for gender differences are impossible to determine. The low scores for synchronous performance expectations may be explained by some of the comments students furnished in the open-ended questions. Namely, one student said, "The chat room is sometimes difficult to participate in because there are many conversations going on at the same time. Responses to questions can get confusing and many times I will type a response and before I get a chance to post it, the topic changed." Another indicated that it was hard to stay online in a chat room discussion with the equipment. Still another stated, "Chat rooms were new to me this semester, and when we began it was difficult to keep up in the chat. Now I feel much more comfortable with it."

Further research should explore self-efficacy measures specific to students' satisfaction in using Web-course tools in online courses. Even though statistical significance was lacking, it was evident that self-efficacy was important in online learning communities. Due to a deficiency in statistical power, pursuing these measures of online self-efficacy is certainly defensible given larger sample sizes for discriminating between levels of this construct. Studies conducted by King (2001) and Schunk and Zimmerman (1997) suggested that there could be a strong relationship between self-efficacy and self-regulation. Additional research needs to focus on their combined effects so that students perform significantly better and have more favorable attitudes

toward instruction by feeling more confident and using their time more efficiently. Taken individually, each variable examined in this study was piecemeal, however teachers need a holistic perspective for creating environments that engage and foster satisfactory conditions for learning. By determining levels of self-efficacy, teachers will have a better understanding of one of the elements that make up a profile of students' characteristics necessary for their success in an online environment.

Self-Regulated Learning Strategies

Discussion of results. To satisfy the second objective in this study, it was necessary to determine how students' satisfaction differed with respect to their level of self-regulated learning strategies (SRLS) in an online distance education course. For each of the 31 items related to self-regulation from the online self-efficacy and learning strategies survey, participants self-selected from one stem item on a 5-point scale that asked, "When you study for this class, how true are these statements about you?" The scale items were: 1 (*not at all true of me*), 2 (*rarely true of me*), 3 (*sometimes true of me*), 4 (*often true of me*), to 5 (*always true of me*). Higher scores suggested that students were self-regulated learners with more organization, time management, and concentration skills than students that scored lower (Schunk, 1990; Schunk & Zimmerman, 1997). For the revised version of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991), reliability coefficients for internal consistency for the 26 students that participated in the study were calculated for each subscale: (a) metacognitive self-regulation (r = .83), (b) time and study environment (r = .85), (c) effort regulation (r = .58), (d) peer learning (r = .78), and (e) help seeking (r = .65). The overall alpha coefficient, r = .92, indicated the scale had sufficient homogeneity (Huck, 2000).

Based upon students' SRLS scores and frequency distributions, scores were trifurcated into top, middle, and bottom groups (33rd percentiles). Each group was then labeled: 1 = low, 2 = medium, and 3 = high. Scores were evenly distributed for each level of five subscales. The lowest scores were recorded for peer learning (M_1 = 2.13, M_2 = 2.85) and help seeking (M_1 = 2.50, M_2 = 3.27) subscales. Scoring ranged from 1.00 to 4.00 for S_1 and 1.67 to 4.50 for S_2 on both subscales. Highest mean scores appeared in time and study environment (M_1 = 3.72, M_2 = 3.93) and effort regulation (M_1 = 3.83, M_2 = 4.20).

Seven items were reverse scored on the survey instrument in the *Final Section* of the self-efficacy and learning strategies survey. Those items were #1 and #17 relating to the metacognitive subscale, #13 and #28 relating to time and study environment, #5 and #19 for effort regulation, and #6 for help seeking. There were no reverse scored items included in the peer learning subscale. For all reverse scored items, only two students selected higher scale scores in S_1 and only one student in S_2. In this instance, there may be some justification for habituation. This applies to a series of questions that all have the same answer choices. This means that respondents will start selecting the same answer without carefully reading each item (Creative Research Systems, 2004). Another factor that could have prevented responses from shifting on negative items might be that the scale points appeared next to each radio button in the survey. Respondents may have assumed that these numbers were selected to reinforce the meanings of the words instead of interpreting the statements as contradictory (Krosnick, 1999). If that were the case, the survey items could have been confusing since the first question in the series was a reverse score item.

Despite some confusion with the reverse-score items, the results from the one-way ANOVA for S_1 were statistically significant at the .05 level, $F(2, 12) = 5.77$, $p = .018$, $\eta_p^2 = .49$.

They were not statistically significant for S_2, $F(2, 8) = 2.56$, $p = .138$, $\eta_p^2 = .39$. Although the results from analysis of variance were not fully supported by both samples, the mean scores for low self-regulated learning strategies ($M_1 = 2.71$, $M_2 = 2.53$) were lower than the mean scores for satisfaction in the high self-regulatory group ($M_1 = 3.43$, $M_2 = 3.75$). The literature review stated students with higher levels of SRLS would be more satisfied with their online course experience (Bernard et al., 2000; McLoughlin & Luca, 2002; O'Hanlon, 2001). Regardless of the lack of statistical significance for S_2 between levels of self-regulation, a larger sample size may have produced more results that were conclusive.

Implications for practice and research. The general conclusion derived from the research findings, given the statistical significance in one sample and not the other, insinuates that self-regulation was a problem for S_1; however, it was not for S_2. Since the participants in S_2 were comprised of graduate students (82%), it was likely that they were already relatively highly self-regulated. On the other hand, S_1's participants were primarily undergraduate students (67%). In addition, the mean age for S_1 was 25 years, whereas it was 38 years of age for S_2. More mature and higher educated students may require less help seeking and already know how to manage their time and study environment. The manner in which the courses were presented online may also have influenced the results. Each student was assigned in Sample S_2 to several help forums. Virtual office hours with the instructor were available every week at a scheduled time. For Sample S_1, there was discussion topics that students were required to participate in every week. Both courses had several instructional tools available online, e.g., useful links, rubrics, technical resources, syllabi, and assignments.

Comments from the open-ended question on the survey may provide additional insight into participants' attitudes regarding self-regulation, effort and time management, and help

seeking. One of the participants stated, “This is my first online course experience, so I am a little nervous about the organization of my three classes so that I get everything in on time.” Yet another maintained, “I think self-paced are somewhat easier. There may be a lot of busy work, but I find that online courses are much easier.” In relation to time management, a participant said, “I have had to schedule my time differently and this has taken quite an adjustment for me. Fortunately, I organize and plan my time well as a result of many years in management.” These comments seem to substantiate that self-regulation needs to be addressed when preparing online distance education courses. Not considered were measures of success in relation to students’ self-regulatory skills. Students’ satisfaction cannot be determined by SRLS alone, but may be influenced by the method of course delivery, motivation, social influences (or the absence of such in an asynchronous environment), instructors’ immediacy behaviors, or personality traits (Arbaugh, 2001; Hargis, 2000; Niemczyk & Savenye, 2001; Schunk & Zimmerman, 1997).

Notwithstanding the underpinnings of structural features that could cause students to rate peer learning and help seeking items negatively, there may be other contributing factors. One of the characteristics of self-regulation requires students to be active participants in their own learning. However, they must also be able to realize when they need help and how to ask for it. Social support from the learning community is widely used by self-regulated learners (Haythornthwaite et al., 2000; Zimmerman, 1989). On the contrary, some students may view seeking assistance as a sign of weakness. As one student stated, “I treated this course like an independent study class. The interaction with peers was not necessary for me in most cases.” One other comment from the survey during the pilot study presents an interesting perspective:

> My scores were lower than I would have rated myself as an online learner. I am pretty self-directed. I believe they relied heavily on contact with other students for help with

content questions. I am far more likely to seek outside text sources, like Internet material or other books rather than contact students since I hate to bother other students and I may not get immediate feedback. I have even used Internet searches to supplement my learning while I was online in synchronous class (multi-tasking). I was unsure what facets the scales measured. There seems to be an emphasis on collaboration with fellow students. I had one online class that was outside of my department. I had very little in common with the other students so I pretty much kept to myself. I feel I learned quite a bit but didn't feel much community.

Further research needs to investigate methods for encouraging social support especially since students are involved in a computer-supported learning situation that restricts communication through media not suitable for maintaining social bonds. To address structural features, future survey designs should consider removing numbers next to each item and making sure the first question's response follows the scale rating. Moreover, larger sample sizes are needed to adequately examine the different relationships that influence self-regulation.

Prior Computer Experience

Discussion of results. The third research objective was to determine how students' satisfaction differed with respect to their level of prior computer experience in an online distance education course. Participants rated each of the six items related to prior computer experience from the self-efficacy and learning strategies survey according to the extent of their level of experience with word processing software, presentation software, navigating the Web, and using e-mail. A 4-point Likert scale was used ranging from 1 (*none*), 2 (*beginner: knows a few operations*), 3 (*competent: knows basic operations in all categories*), to 4 (*expert: can teach others*). Higher scores indicated students were experienced computer users and were familiar

with the technologies used in a Web-based learning environment. Internal consistency estimates of reliability of the six items was .81, indicating satisfactory reliability (Huck, 2000).

Based upon students' prior computer experience scores and frequency distributions, the scores were bifurcated into high and low groups (50^{th} percentiles). Each group was then labeled: 1 = novice or 2 = expert. Scores were evenly distributed for each level. Slightly over half of the respondents (53%) were categorized in the novice range for S_1, whereas 54% fell within the expert range for S_2. For S_1, 87% and S_2, 82% had only previously taken at least one online course. For the majority of the participants in S_2, their previous experience was the course they took for the pilot study that was conducted.

The results of the independent samples *t* tests were not statistically significant for S_1 at the .05 level, $p = .060$ or for S_2, $p = .162$. The mean score for novice users ($M_1 = 2.95$, $M_2 = 2.88$) was lower than the mean score for satisfaction for the expert group ($M_1 = 3.43$, $M_2 = 3.59$). The literature review stated students with higher levels of prior computer experience would be more satisfied with their online course experience (Debowski et al., 2001; Fredericksen et al., 1999; Huang, 2002). More definitive and meaningful results would probably have been supported with a larger sample size.

Implications for practice and research. In all likelihood, many researchers would consider six items insufficient for measuring a construct. However, with all of the other input measures taking place in this study, these items were deemed adequate for evaluating prior computer experience. Determining students' preparation or ability to undertake the learning objectives of a course are essential if instructors are to empower learners in their online distance education classes. In a study conducted by Picciano (1998), his recommendations for online instruction were to evaluate students on an ongoing basis to determine if instructional methods

meet the needs of the students. Even though the majority of the students owned their own computer (>=94%), familiarity with word processing software and surfing the WWW appears to have been less than expected. Prior research has indicated that unfamiliarity with technology can also adversely affect students' self-efficacy beliefs (Bernard et al., 2000; Chang, 2000; Chen, 2002). It would be informative to see how prior computer experience compared to levels of online self-efficacy. Without a larger sample size, any conclusions would be purely conjecture. However, the results merit investigating these factors more thoroughly.

Participation

Discussion of results. The fourth research objective was to determine how students' satisfaction differed with respect to their level of participation in an online distance education course. Levels of participation were based upon an analysis of interaction patterns and structural features of online discussions. In an effort to determine if a student's postings to bulletin board discussions initiated a discussion thread or were in response to a previous posting, a participation-interactivity (PI) score was computed. The number of messages with replies was multiplied by an activity index (AI) computation for calculating an individual's PI score. Activity index was determined by taking a student's total replies generated from their postings and dividing that by the sample total; reported in units of 10. Each student's presence was determined by multiplying total postings with a density index calculation (DI). Density index was the result of word counts per student divided by the total sample's word count in units of 10. Presence represents the degree to which students project themselves socially. Both raw scores were combined for each student. Higher scores indicated students were more participatory, whereas low scores signified less active engagement in online discussions. Reliability coefficient

for internal consistency for the participation score, r = .83, indicated sufficient homogeneity (Huck, 2000).

Based upon students' total participation scores and frequency distributions, the scores were trifurcated into top, middle, and bottom groups (33rd percentiles). Each group was labeled: 1 = low, 2 = medium, and 3 = high. Scores were evenly distributed for each calculation. However, the distribution of frequencies was positively skewed in the case of S_2. (kurtosis = 9.54, skewness = 3.02). One student's participation score represented 55% of the sample total. It would be more realistic to exclude this student from the calculations; however, this would have belied the purpose of quantifying interaction. Human nature dictates that someone will communicate more than others do. The fact that all of the participants were females could support significant differences in participation, although findings have been inconclusive on gender differences in online classes (Wu & Hiltz, 2004).

While participants had different levels of participation, these differences did not have much effect on satisfaction, as there were no statistically significant results from analysis of variance. Despite the fact they were not statistically supported, there were some interesting findings observed that might contribute to an understanding of how participation in online discussions influences students' satisfaction. Almost all of the students in S_1 participated at the same level. This may be because participation was required for S_1 but not for S_2. For S_1, the average word count for participants was 3,423 versus 1,223 for S_2. The average word count for S_1 was almost three times greater than S_2's. The average number of total postings for S_1 was 21 whereas for S_2 it was 19. One student in S_2 accounted for almost 25% of the total postings for the group. This student had also participated in the pilot study. In fact, six out of the 11 students (55%) in S_2 were also in the pilot. The average number of original postings for S_1 was five and

for S_2 were four. When online discussion is a required course component, prior research indicated students were more active, they perceived more learning taking place, and in turn were more satisfied with their course experience (Jung et al., 2002; Wu & Hiltz, 2004).

Implications for practice and research. In online distance education, one of the most salient issues to emerge from the literature is the need to increase interaction and feedback (McLoughlin & Luca, 2002). For self-regulated learning, feedback is an important mechanism for interpreting outcomes and evaluating the quality of information processing (Butler & Winne, 1995). Students' belief in their efficacy regulates their learning through feedback and determines their attitude and abilities for achieving their goals (Bandura, 1993). Self-efficacious learners make the choice for themselves how much effort they will expend and adjust their self-regulation accordingly (Schunk & Zimmerman, 1997; Zimmerman, 1989, 1995). Further research should keep in mind the interrelation of participation, self-efficacy, and self-regulation relevant to student satisfaction in online courses and propose recommendations for course and program design based on these factors.

As important as conversations are, perhaps for this study, including participation in the research design was overreaching due to the small sample size. However, that is not meant to imply that participation from a quantitative perspective is insignificant and analysis is immaterial. On the contrary, paying attention to the social aspects of a learning environment so instructors can increase engagement and enhance learning is important for improving students' satisfaction (J. Hill & Raven, 2000). For asynchronous online courses, communicating through text is the only means of connecting with other students and the instructor. Text-based messages employ rigorously structured thinking that promotes cognitive processing (Benigno & Trentin,

2000; Garrison et al., 2001; Henri, 1992; Poscente, 2002; Thorpe, 1998). Attempting to derive causal inferences is necessary for identifying factors that contribute to students' success.

Another important element in the interaction process is the instructor. This study primarily focused on the social aspects of students' participation during their online sessions. This study did not analyze communication related to learner-to-teacher interaction. That would have required tracking the number of times the instructor interacted with only the studies' participants. Given the structure of bulletin board discussions, that was difficult to do. For one thing, communication is sometimes one-to-many, i.e., the instructor will post an introductory message intended for everyone. Without distinguishing how many of the postings were in relation to participants in the study, the instructor for S_1 had 50 postings for a total word count of 4,767 and generated four replies. The instructor for S_2 participated 23 times with a word count of 2,177 that prompted 17 replies. Recall that S_2 also maintained virtual office hours and encouraged students to participate at least once per week in chat sessions.

Responsibilities of instructors include organizing and facilitating instruction. In promoting students enjoyment in online distance education classes, the instructors' role is essential (Wu & Hiltz, 2004). With no investigation of an instructor's influence in each course, it is not practical to come to any definitive conclusions regarding students' participation (Abrahamson, 1998). Since interaction is defined in four dimensions: (a) learner-to-instructor, (b) learner-to-learner(s), (c) learner-to-content, and (d) learner-to-interface, it is necessary to include all of these interactions in a comprehensive evaluation of participation (Hillman et al., 1994; Moore, 1989). However, in the absence of sufficient numbers of participants, any further comparisons in this study would have been inconclusive.

The quality of interaction in an online distance education course is an added facet that could be explored more extensively. Many qualitative studies have performed comprehensive content analyses to determine how substantive exchanges were between students and instructor (Anderson et al., 2001; Hara et al., 2000). These studies used coding schemes to categorize messages by social cues, greetings, or profound responses (Anderson et al., 2001; Garrison et al., 2001; Rourke et al., 1999). There were several instances, in this study, where participants posted their assignments directly to the bulletin board as discussion items. As a result, their participation-presence score would have been overstated. This was not the case for S_1; however, S_2's participants did this on several occasions especially if they were unable to upload their papers properly to the Web site. It would have been advantageous to compare technical proficiency and prior computer experience to the 'quality' of participation.

Comments from the open-ended question on each survey furnished by participants help analyze the learning experience. The comments presented in Table 18 recap students' perspective on the effects of communication in their online course. Note that the comments are unedited and grammatical errors remained uncorrected. The samples are not identified in order to maintain instructors' confidentiality.

Gender

Discussion of results. The final research objective was to determine how students' satisfaction differed with respect to their gender in an online distance education course. Of the 15 students in S_1, 12 (83%) were female. All 11 (100%) participants for S_2 were females. Understandably, the *t* test for independent groups did not support any statistically significant results for S_1. Since all of the participants were female for S_2, no comparisons could be made. Notwithstanding any statistical findings, gender represents an important aspect in evaluating

Table 18.

Summary of Students' Responses to Open-Ended Questions

Students' Comments
1. I would not like to exclusively take online courses because I miss the face-to-face interaction with the instructor and the other students.
2. The instructor sets the tone for communication and life on the "boards." I am currently taking a class with dead boards…nothing to discuss…no need to check or post.
3. I'm enjoying the online courses, but am old-fashioned and feel especially fortunate to have a fellow cohort member at my school. She and I often get together to discuss the work face to face, which I much prefer to online chats.
4. Feel like I get a lot more out of traditional classes. I have problems focusing my vision, and it's really hard to follow an online chat. If I knew before I applied to UGA that most of my classes were going to be online, I would have applied somewhere else.
5. I have had two different instructors for my online classes. I find that the one who combined at least two face to face sessions in addition to the online classes was more helpful. I also found that the more structured the professor the more I learned form the course. I am a social person and weekly e-mails form the structured professor was a big help! It very much helped keep me on track. I have found that this class is more of a "push" type communication. Information is pushed out there in no particular organized structure and it is up to me to find it. I work better with the "pull" type communication.
6. I really did not enjoy the level of interaction that I had. I do not feel that the artificial world lends itself to building relationships that generate my deep understanding of other people and my desire to care about their performance.
7. This is my first online course experience, so I am a little nervous about the organization of my three classes so that I get everything in on time. I do feel better about communicating through e-mail now that I have started these courses because that is the only way to discuss class material.
8. Not having an actual class time when there is teacher student contact is sometimes discouraging because it can make asking questions difficult.

students' satisfaction. How gender effects satisfaction is unclear. However, in investigating the characteristics of learners in online distance education, gender is an individual factor that affects perceptions in other areas of education. Whether it affects satisfaction in online distance education cannot be decided given the small sample size in this study.

Implications for practice and research. Since online discussions depend on everyone's contributions, a loud voice or an intimidating demeanor does not get the attention it would in a face-to-face classroom. No one can actually 'see' what another person is doing. The only representation that other students or the instructor has is the words displayed on a computer screen. Some instructors post pictures of their students online in order to encourage participation and to create a community of learners. Researchers have yet to determine if this is a good thing. No prior research examines closely whether anonymity is an issue in asynchronous settings.

In a study conducted by Steward, Shields, Monolescu, and Taylor (1999), an analysis of discussions revealed that men sent more messages than women did, and men always started and ended each session. Previous computer experience and self-efficacy differences in men and women have also been explored in prior studies (T. Hill et al., 1987; Wu & Hiltz, 2004), however there were no definitive conclusions. One study captured gender data, however only descriptive data was reported (Spiceland & Hawkins, 2002). While overall, the consensus is that gender differences do not exist in online distance education, the impetus of technological improvements that will allow a broader range of pedagogical activities where virtual classrooms depict 'real' classrooms, gender issues may again crop up (Dede & Kremer, 1999). Until then, future research needs emphasis placed on why discussions differ in content and quality rather than on gender.

Contributions of the Study

This study was useful in providing instruments and measurement techniques that met sufficient standards for evaluating the effect of students' learning strategies on satisfaction in online distance education courses. The proliferation of online course offerings has brought to the forefront issues that raise concerns about quality, quantity, and ability to mediate technical resources in distance education (Bonk, 2002; NEA, 2000a; Riva, 2001). Understanding these constructs is important for educators and higher education institutions since there are major methodological issues that need to be addressed in designing effective online courses.

Many studies have focused on the differences between traditional and face-to-face online classes. However, not enough is known about the characteristics of learners that are satisfied and succeed in Web-based environments (Ely, 2001; Halsne & Gatta, 2002; Osika & Sharp, 2002; Sherry, 1996; A. Wang & Newlin, 2000; Wolfe, 2001). Most of the studies have been limited in focus. Several have examined self-efficacy, self-regulated learning strategies (SRLS), participation, prior computer experience, and gender separately or in some combination, but no study has attempted to develop instruments and compare all of the aspects that compose a profile of students' characteristics in online classes. As such, this study tried to address some of the concerns raised by Phipps and Merisotis (1999) regarding deficiencies in certain elements of quality research.

In response to one of Phipps and Merisotis' concerns, this study was successful in developing a valid and reliable instrument to measure students' satisfaction. In fact, the validity and reliability of all of the instruments were performed by conducting panel reviews and a pilot test followed by instrument administration over a six-month period. Phipps and Merisotis were also critical that research had not taken into account differences among students. This study

extensively investigated differences in levels among individual courses rather than between dissimilar classes of distance and traditional learners. For this reason, each sample was evaluated separately for variations in gender, age, educational level, and number of online courses previously taken. In other words, the focus was discovering reasons for students' satisfaction rather than looking for evidence to discredit traditional or Web-based distance education. Additional criticisms were aimed at the absence of any theoretical underpinnings. By using theory to guide its framework, this study laid the foundation for future researchers to build upon in addressing important issues regarding distance education.

From this study, I found that there were statistically significant differences in satisfaction among the different levels of self-regulated learning strategies (SRLS). That in fact, students with lower levels of SRLS were less satisfied with their course experience. However, this only held for one sample, but not the other. Sorely missing were sample sizes large enough to definitively answer any of the study's research questions. In view of the fact that the effect size was too large and the study was seriously underpowered, future improvements to study design, e.g., randomization, experimental conditions, and larger sample sizes could render more significant results.

In addressing social cognitive theory and its application to prior computer experience, self-efficacy, and SRLS, this study provided important insight into some of the causal factors that influence satisfaction in distance learning. Investigating behavioral, environmental, and personal influences by incorporating self-efficacy, SRLS, gender, and participation into the design model proved beneficial in understanding the effects of cognitive behaviors (Bandura, 1986; Corno & Mandinach, 1983; Pajares, 2002; Schunk & Zimmerman, 1997; Zimmerman, 1995). Although any generalizations beyond very conservative ones are not recommended, the

importance of SRLS adds to the body of literature on conceptualizing a profile of learners' characteristics in online classes.

A tangential result of this study was the development of reliable instruments to measure prior computer experience, self-efficacy, SRLS, and satisfaction. The modifications to the MSLQ proved beneficial in measuring students' perceptions of their ability to regulate their learning environment. Finessing the wording on some of the questions to reflect online environments and reducing the scales from seven to five points will furnish researchers an important tool for measuring SRLS. Providing a section for comments offered insights into the inconsistencies some students perceived in items measured in the subscales for help seeking and peer learning. With this information, instructors can make students aware of effective learning strategies to help them identify the appropriate ones to use in different learning situations (Chen, 2002).

The instrument developed for self-efficacy can be utilized by researchers in establishing specific skills required by students in online distance learning settings. Specifying Web-course tools and the skills associated with them will help instructors in determining which students lack the necessary competencies for succeeding. Used in conjunction with instrument items addressing prior computer experience, instructors will be better able to determine if training may be necessary before the start of an online course (Miller et al., 2003).

One of the more important contributions of this study was the development of formulas and criteria for quantitatively evaluating participation in online bulletin board discussions. Evaluating bulletin board discussions takes more time than examining exchanges in traditional classes, especially when communication and interaction is extensive. Participation in asynchronous online courses is comparable to a student speaking in a traditional face-to-face

class. Since the primary method of speaking is represented as text in a Web-based setting, there are major differences in the manner in which students project themselves (Picciano, 1998). For one thing, students have more time to develop their thoughts before they post any comments. Once their comments are posted, the text represents a permanent record of their views that can be downloaded and scrutinized later or it can be completely ignored and obliterated with one press of the delete button.

It was essential to provide guidelines for reviewing an individual student's participation in bulletin-board discussions to facilitate an understanding of current behavior in online classes. The formulas developed for determining PP and PI may not be sufficient for ensuring quality interaction, however, they are helpful to instructors in navigating the myriad of text-based conversations that constitute the primary method of online communication. By standardizing methods for evaluating individual's contributions to the learning environment, benchmarks can be established to measure whether online programs are responsive to students' needs. Teachers will be able to determine which students have become disengaged and need more encouragement to belong to the learning community. With the establishment of a method for measuring participation presence (PP) and participation interactivity (PI), this study has provided a new tool for gauging acceptable levels of communication in predicting students' satisfaction with their online course experience.

The concept of distance education is not a new one. In fact, it has been around for over 150 years. Much like the original correspondence courses, current online distance educations' students and instructors are geographically separated (Keegan, 1986). What is new are the technological tools being used to deliver and administer online courses. Revenue projections from online courses offered in higher education institutions are estimated to reach billions of

dollars (Kriger, 2001). With so much at stake, it is imperative that researchers attempt to identify criteria that constitute quality online distance teaching and learning. As a result, this study has undertaken an in-depth analysis of the complex characteristics of students that are satisfied with their online course experience with the hope that this will provide important information about what constitutes success for students and instructors.

REFERENCES

Abrahamson, C. (1998). Issues in interactive communication in distance education. *College Student Journal, 32*(1), 33-42.

Adrian, C. (2000). Developing a learning environment: Applying technology and TQM to distance learning. In L. Lua (Ed.), *Distance learning technologies: Issues, trends and opportunities* (pp. 107-123). Hershey, PA: Idea.

Aliponga, J. (2003). Developing learner autonomy online. *Centre for Development of Teaching and Learning (CDTL) Brief, 6*(1). Retrieved May 29, 2003, from http://www.cdtl.nus .edu.sg/brief/V6n1/sec3.htm

Anderson, T., Rourke, L., Garrison, D., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context [Electronic version]. *Journal of Asynchronous Learning Networks, 5*(2), 1-17.

Arbaugh, J. (2000). How classroom environment and student engagement affect learning in Internet-based MBA courses. *Business Communication Quarterly, 63*(4), 9-26.

Arbaugh, J. (2001). How instructor immediacy behaviors affect student satisfaction and learning in Web-based courses. *Business Communication Quarterly, 64*(4), 42-54.

Armstrong, S. (1991). Another note on survey return rates. *The Journal of Consumer Marketing, 8*(3), 57-62.

Arsham, H. (2002). Impact of the Internet on learning and teaching. *United States Distance Learning Association Journal, 16*(3). Retrieved from http://www.usdla.org/html/journal/ MAR02_Issue/article01.html

Ary, D., Jacobs, L., & Razavieh, A. (1996). *Introduction to research in education* (5th ed.). Orlando, FL: Harcourt.

Aviv, R. (2000). Educational performance of ALN via content analysis [Electronic version]. *Journal of Asynchronous Learning Networks, 4*(2), 53-72.

Baker, W., & Hale, T. (1997). Technology in the classroom [Electronic version]. *Educom Review, 32*(5), 42-49.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Upper Saddle River, NJ: Prentice Hall.

Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), *Annals of child development* (Vol. 6, pp. 1-60). Greenwich, CT: JAI Press.

Bandura, A. (1991a). Human agency: The rhetoric and the reality [Electronic version]. *American Psychologist, 46*(2), 157-162.

Bandura, A. (1991b). Social cognitive theory of moral thought and action. In W. Kurtines & J. Gewirtz (Eds.), *Handbook of moral behavior and development* (Vol. 1, pp. 45-103). Hillsdale, NJ: Erlbaum.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning [Electronic version]. *Educational Psychologist, 28*(2), 117-148.

Bandura, A. (1994). Self-efficacy [Electronic version]. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.

Bandura, A. (1997). Self-efficacy [Electronic version]. *Harvard Mental Health Letter, 13*(9), 4-7.

Bandura, A. (2001). Guide for constructing self-efficacy scales (Revised) (pp. 29): Available from Frank Pajares, Emory University, Atlanta, GA: muthwoom-seg@yahoo.com

Bandura, A., & Locke, E. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology, 88*(1), 87-99.

Beatty, B., & Bonk, C. (2001, August). *Online interaction: Just how smart are Starter-Wrapper discussions in the Smartweb?* Paper presented at the annual conference of Distance Teaching and Learning (17th), Madison, WI.

Belanger, F., & Jordan, D. (2000). *Evaluation and implementation of distance learning: Technologies, tools and techniques.* Hershey, PA: Idea.

Belson, W. (1986). *Validity in survey research*. Brookfield, VT: Gower.

Benigno, V., & Trentin, G. (2000). The evaluation of online courses. *Journal of Computer Assisted Learning, 16,* 259-270.

Berge, Z., & Collins, M. (1995). Computer-mediated communication and the online classroom in distance learning. *Computer-Mediated Communication Magazine, 2*(4). Retrieved from http://www.ibiblio.org/cmc/mag/1995/apr/berge.html

Bernard, R., Rojo de Rubalcava, B., & St-Pierre, D. (2000). Collaborative online distance learning: Issues for future practice and research. *Distance Education; Melbourne, 21*(2), 260-277.

Bonk, C. (2002). Online teaching in an online world. *United States Distance Learning Association Journal, 16*(1). Retrieved from http://www.usdla.org/html/journal/JAN02_Issue/article02.html

Borenstein, M., Rothstein, H., & Cohen, J. (2000). Power and Precision (Version 2.0.37) [Computer software]. Englewood, NJ: Biostat.

Bork, A. (1999). The future of learning [Electronic version]. *Educom Review, 34*(4) 24-30.

Boulton, J. (2002). *Web-based distance education: Pedagogy, epistemology, and instructional design.* Retrieved May 24, 2003 from the University of Saskatchewan Web site: http:// www.usask.ca/education/coursework/802papers/boulton/

Bourne, J., McMaster, E., Rieger, J., & Campbell, J. (1997). Paradigms for on-line learning: A case study in the design and implementation of an asynchronous learning networks (ALN) course. *Journal of Asynchronous Learning Networks, 1*(2), 38-56.

Brem, S. (2002). Analyzing online discussions: Ethics, data and interpretation [Electronic version]. *Practical Assessment, Research & Evaluation, 8*(3), 1-10.

Brown, B., & Liedholm, C. (2002). Can Web courses replace the classroom in principles of microeconomics? *American Economic Review, 92*(2), 444-449.

Brown, G., & Wack, M. (1999). The difference frenzy and matching buckshot with buckshot. *The Technology Source*. Retrieved June 2, 2003, from the Michigan Virtual University Web site: http://ts.mivu.org/default.asp? show=article&id=459

Browne, T. (2001). Human development theories [Electronic version]. *Futurics, 25*(1/2), 50-71.

Bruce, B. (1999). Education online: Learning anywhere, any time. *Journal of Adolescent & Adult Literacy, 42*(8), 662-665.

Buckland, M., & Dye, C. (1991, October). *The development of electronic distance education delivery systems in the United States: Recurring and emerging themes in history and philosophy of education.* Paper presented at the annual conference of the Midwestern Educational Research Association (13th), Chicago, IL.

Bullen, M. (1998). Participation and critical thinking in online university distance education. *Journal of Distance Education, 13*(2). Retrieved from http://cade.athabascau.ca/ vol13.2/bullen.html

Burbules, N., & Callister, T. (2000). Universities in transition: The promise and the challenge of new technologies. *Teachers College Record, 102*(2), 271-293.

Butler, D., & Winne, P. (1995). Feedback and self-regulated learning: A theoretical synthesis [Electronic version]. *Review of Educational Research, 65*(3), 245-271.

Carnevale, D. (2002, February). Online students don't fare as well as classroom counterparts, study finds. *Chronicle of Higher Education*. Retrieved June 7, 2003, from http://chronicle.com/free/2002/02/2002022501u.htm

Carrell, L., & Menzel, K. (2001). Variations in learning, motivation, and perceived immediacy between live and distance education classrooms. *Communication Education, 50*(3), 230-240.

Chang, C.-S. (2000). *The effect of attitudes and self-efficacy on college student performance in online instruction.* Unpublished doctoral dissertation, University of Missouri, Columbia.

Chen, C. (2002). Self-regulated learning strategies and achievement in an introduction to information systems course. *Information Technology, Learning, and Performance Journal, 20*(1), 11-25.

Choi, N., Fuqua, D., & Griffin, B. (2001). Exploratory analysis of the structure of scores from the multidimensional scales of perceived self-efficacy. *Educational & Psychological Measurement, 61*(3), 475-489.

Clark, R. (1994). Media will never influence learning. *Educational Technology Research and Development, 42*(2), 21-29.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cole, J. (2001). *The UCLA Internet report 2001: Surveying the digital future*. University of California in Los Angeles (UCLA) Center for Communication Policy.

Cole, J. (2003). The UCLA *Internet report 2003: Surveying the digital future*. University of California in Los Angeles (UCLA) Center for Communication Policy.

Conrad, D. (2002). Deep in the hearts of learners: Insights into the nature of online community. *Journal of Distance Education, 17*(1). Retrieved from http://cade.athabascau.ca/vol17.1/conrad.html.

Cook, C., Heath, F., & Thompson, R. (2000). A meta-analysis of response rates in Web or Internet-based surveys [Electronic version]. *Educational & Psychological Measurement, 60*(6), 821-836.

Corno, L. (1998). Topics for the new educational psychology. *Teachers College Record, 100*(2), 213-221.

Corno, L., & Mandinach, E. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist, 18*(2), 88-108.

Creative Research Systems. (2004). *Survey design*. Retrieved June 13, 2004, from http://www.surveysystem.com/sdesign.htm

Creswell, J. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Cronbach, L., & Meehl, P. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52*, 281-302.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London: Sage.

Czubaj, C. (2000). Cyberspace curricula: A global perspective. *Journal of Instructional Psychology, 27*(1), 9-14.

Czubaj, C. (2001). Policies regarding distance education. *Education, 122*(1), 119-122.

Dahm, T. (1998). *Design tip: Screen width*. Retrieved May 6, 2004, from http://www .netmechanic.com/news/vol1/design_no1.htm

Davidson-Shivers, G., Tanner, E., & Muilenburg, L. (2000). *Online discussion: How do students participate?* Paper presented at the American Educational Research Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED443410)

Debowski, S., Wood, R. E., & Bandura, A. (2001). Impact of guided exploration and enactive exploration on self-regulatory mechanisms and information acquisition through electronic search. *Journal of Applied Psychology, 86*(6), 129-141.

Dede, C. (1996). Emerging technologies and distributed learning. *American Journal of Distance Education, 10*(2), 1-27.

Dede, C., & Kremer, A. (1999). Increasing students' participation via multiple interactive media. *Inventio, 1*(1). Retrieved May 24, 2003, from http://www.doit.gmu.edu/Archives/ feb98/cdede.htm

Dede, C., & Palumbo, D. (1991). Implications of hypermedia for cognition and communication. *International Association for Impact Assessment Bulletin, 9*(1-2), 15-28.

Delcourt, M., & Kinzie, M. (1993). Computer technologies in teacher education: The measurement of attitudes and self-efficacy [Electronic version]. *Journal of Research and Development in Education, 27*(Fall), 35-41.

Denning, P. (1996). How we will learn. *Center for the New Engineer*. Retrieved June 30, 2003, from http://cne.gmu.edu/cne/perspectives/

De Vaus, D. (2002). *Surveys in social research* (5th ed.). London: Routledge.

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan.

Dewey, J., & Bentley, A. (1949). *Knowing and the known*. Boston, MA: Beacon Press.

Diaz, D. (2000). Carving a new path for distance education research [Electronic version]. *The Technology Source*. Retrieved June 2, 2003 from the Michigan Virtual University Web site: http://ts.mivu.org/default.asp?show=article&id=648

Diaz, D., & Cartnal, R. (1999). Students' learning styles in two classes: Online distance learning and equivalent on-campus. *College Teaching, 47*(4), 130-135.

Dillman, D. (1978). *Mail and telephone surveys: The total design method*. New York: Wiley.

Dillman, D. (2000). *Mail and Internet surveys: The tailored design method* (2nd ed.). New York: Wiley.

Dillman, D., & Bowker, D. (2001). *The Web questionnaire challenge to survey methodologists*. Retrieved from Washington State University Social and Economic Sciences Research Center Web site: http://survey.sesrc.wsu.edu/dillman/papers.htm

Dillman, D., Tortora, R., & Bowker, D. (1998). *Principles for constructing Web surveys: An initial statement* (Technical Report No. 98-50). Pullman, WA: Washington State University Social and Economic Sciences Research Center.

Dodwell, P., & Humphrey, G. (1990). A functional theory of the McCollough Effect [Electronic version]. *Psychological Review, 97*(1).

Draves, W. (2001). *Learning on the Net*. River Falls, WI: Lern.

Duderstadt, J. (1997). The future of the university in an age of knowledge [Electronic version]. *Journal of Asynchronous Learning Networks, 1*(2), 78-88.

Easton, M., & LaRose, R. (2000). Internet Self-efficacy and the psychology of the digital divide. *Journal of Computer-Mediated Communication, 6*(1). Retrieved from http://www.ascusc .org/jcmc/vol6/issue1/eastin.html

Edelstein, S., & Edwards, J. (2002). If you build it, they will come: Building learning communities through threaded discussions. *Online Journal of Distance Learning Administration, 5*(1). Retrieved from http://www.westga.edu/~distance/ojdla/spring51/ edelstein51.html

Ely, D. (2001). Confessions of an online distance educator. *ERIC Update, 22*(1). Retrieved June 15, 2004, from http://mirror.eschina.bnu.edu.cn/Mirror1/accesseric/www.ericit.org/ newsletter/Volume22/ely.html

Eom, W., & Reiser, R. (2000). The effects of self-regulation and instructional control on performance and motivation in computer-based instruction. *International Journal of Instructional Media*, *27*(3), 247-260.

Erffmeyer, R., & Lane, I. (1984). Quality and acceptance of an evaluative task: The effects of four group decision-making formats. *Group & Organization Studies, 9*(4), 509-529.

Eshell, Y., & Kohavi, R. (2003). Perceived classroom control, self-regulated learning strategies, and academic achievement. *Educational Psychology*, *23*(3), 249-260.

Fahy, P., Crawford, G., & Ally, M. (2001). Patterns of interaction in a computer conference transcript. *International Review of Research in Open and Distance Learning, 2*(1). Retrieved June 3, 2003, from http://www.irrodl.org/content/v2.1/fahy.html

Fitzgerald, M., Lovin, V., & Branch, R. (2003). The Gateway to educational materials: An evaluation of an online resource for teachers and an exploration of user behavior. *Journal of Technology and Teacher Education, 11*(1), 21-51.

Fowler, F., Jr. (1993). *Survey research methods* (2nd ed. Vol. 1). Newbury Park, CA: Sage.

Fowler, F., Jr. (2002). *Survey research methods* (3rd ed. Vol. 1). Thousand Oaks, CA: Sage.

Frary, R. (2002, March). *A brief guide to questionnaire development*. Retrieved September 7, 2003, from http://www.testscoring.vt.edu/fraryquest.html

Fredericksen, E., Pickett, A., Shea, P., Pelz, W., & Swan, K. (1999). *Student satisfaction and perceived learning with on-line courses: Principles and examples from the SUNY learning network*. Retrieved November 8, 2002, from http://www.aln.org/publications/jaln/v4n2/v4n2_fredericksen.asp

Frey, J., & Fontana, A. (1993). The group interview in social research. In D. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 20-34). Newbury Park, CA: Sage.

Gabriel, M. (2000). *Exploring learner interactions in cyberspace.* Poster session presented at the annual conference of the Canadian Association for Distance Education (16th), Quebec, Canada. Retrieved from http://www.ulaval.ca/aced2000cade/francais/Actes/Gabriel-Martha1.html

Gagne, M., & Shepherd, M. (2001). A comparison between a distance and a traditional graduate accounting class [Electronic version]. *T.H.E. Journal, 28*(9), 58-65.

Gagne, R. (Ed.). (1986). *Instructional technology: Foundations*. Hillsdale, NJ: Erlbaum.

Gagne, R., & Briggs, L. (1979). *Principles of instructional design* (2nd ed.). New York: Holt.

Gagne, R., Briggs, L., & Wager, W. (1988). *Principles of instructional design* (3rd ed.). New York: Holt, Rinehart, & Winston.

Gall, M., Gall, J., & Borg, W. (2003). *Educational research: An introduction* (7th ed.). Boston, MA: Allyn & Bacon.

Garrison, D., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7-23.

Garrison, D., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *American Journal of Distance Education, 1*(1), 7-13.

Gillham, B. (2000). *Developing a questionnaire*. London: Continuum.

Grabe, M., & Grabe, C. (2001). *Integrating technology for meaningful learning* (3rd ed.). Boston, MA: Houghton.

Green, S., Salkind, N., & Akey, T. (2000). *Using SPSS for Windows: Analyzing and understanding data* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.

Grusec, J. (1992). Social learning theory and developmental psychology: The legacies of Robert Sears and Albert Bandura [Electronic source]. *Developmental Psychology, 28*(5), 776-786.

Gunawardena, C., & Boverie, P. (1993). *Impact of learning styles on instructional design for distance education.* Paper presented at the World Conference of the International Council of Distance Education, Bangkok, Thailand.

Gunawardena, C., & Zittle, F. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education, 11*(3), 8-26.

Gunn, H. (2002). Web-based surveys: Changing the survey process. *First Monday, 7*(12). Retrieved November 2, 2003 from http://firstmonday.org/issues/issue7_12/gunn/index.html

Halsne, A., & Gatta, L. (2002). Online versus traditionally-delivered instruction: A descriptive study of learner characteristics in a community college setting. *Online Journal of Distance Learning Administration, 5*(1). Retrieved from http://www.westga.edu/~distance/ojdla/spring51/halsne51.html

Hamilton, J. (1999). *CGI programming 101*. Retrieved February 28, 2004, from http://cgi101.com

Hamlin, T. (1998). *Development and utilization of a perceived needs instrument for Georgia's adult agricultural education program.* Unpublished doctoral dissertation, University of Georgia, Athens.

Hanna, D. (1998). Higher education in an era of digital competition: Emerging organizational models. *Journal of Asynchronous Learning Networks, 2*(1), 66-95.

Hanson, R., & Jubeck, T. (1999). Assessing the effectiveness of web page support in a large lecture course [Electronic version]. *DEOS News, 9*(9), 1-15.

Hara, N., Bonk, C., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology. *Instructional Science, 28*(2), 115-152.

Harasim, L. (1997). *Interacting in hyperspace*. Retrieved May 28, 2003, from the University of Maryland University College Web site: http://www.umuc.edu/ide/potentialweb97/harasim.html

Harasim, L. (1999). A framework for online learning: The Virtual-U [Electronic version]. *Computer* (Cover Feature), 44-49.

Harasim, L., Hiltz, S., Teles, L., & Turoff, M. (1997). *Learning networks: A field guide to teaching and learning online.* Cambridge: Massachusetts Institute of Technology Press.

Hargis, J. (2000). The self-regulated learner advantage: Learning science on the Internet. *Electronic Journal of Science Education, 4*(4), 1-8.

Haythornthwaite, C., Kazmer, M., & Robins, J. (2000). Community development among distance learners: Temporal and technological dimensions [Electronic version]. *Journal of Computer-Mediated Communication, 6*(1), 29.

Heckman, R., & Annabi, H. (2003). *A content analytic comparison of FTF and ALN case-study discussions.* Paper presented at the annual Hawaii International Conference on System Sciences (36th), Big Island, HI. Retrieved from http://csdl.computer.org/comp/proceedings/hicss/2003/1874/01/1874toc.htm

Heerema, D., & Rogers, R. (2001). Avoiding the quality/quantity trade-off in distance education [Electronic version]. *T.H.E. Journal, 29*(5), 14-21.

Henri, F. (1988). Distance education and computer-assisted communication. *Prospects (Paris, France), 18*(1), 85-90.

Henri, F. (1992). Computer conferencing and content analysis. In A. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 115-136). New York: Springer.

Hikmet, N., & Chen, S. (2003). An investigation into low mail survey response rates of information technology users in health care organizations. *International Journal of Medical Informatics, 72*, 29-34.

Hill, J., & Raven, A. (2000). *Online learning communities: If you build them, will they stay?* Retrieved November 1, 2002, from http://it.coe.uga.edu/itforum/paper46/paper46.htm

Hill, R. (2001). Survey research. In E. Farmer & J. Rojewski (Eds.), *Research pathways: Writing professional papers, theses, and dissertations in workforce education* (pp. 201-222). Lanham, MD: University Press of America.

Hill, T., Smith, N., & Mann, M. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology, 72*(2), 307-313.

Hillman, D. (1997). *Improved coding and data management for discourse analysis: A case study in face-to-face and computer-mediated classroom interaction.* Unpublished doctoral dissertation, University of Cambridge, MA. Retrieved October 3, 2003, from http://www.quahog.org/thesis/index.html

Hillman, D., Willis, D., & Gunawardena, C. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *American Journal of Distance Education, 8*(2), 30-42.

Hirumi, A. (2002). A framework for analyzing, designing, and sequencing planned eLearning interactions. *Quarterly Review of Distance Education, 3*(2), 141-160.

Holmberg, B. (1986). *Growth and structure of distance education*. London: Croom Helm.

Holmberg, B. (1989). The concept, basic character and development potentials of distance education. *Distance Education, 10*(1), 127-135.

Howard, C., & Discenza, R. (2000). The emergence of distance learning in higher education: A revised group decision support system typology with empirical results. In L. Lau (Ed.), *Distance learning technologies: Issues, trends and opportunities* (pp. 143-156). Hershey, PA: Idea.

Huang, H.-M. (2002). Student perception in an online mediated environment. *International Journal of Instructional Media, 29*(4), 405-409.

Huberty, C. (1994). *Applied discriminant analysis*. New York: Wiley.

Huck, S. (2000). *Reading statistics and research* (2nd ed.). New York: Longman.

Hurlburt, R. (1998). *Comprehending behavioral statistics* (2nd ed.). Pacific Grove, CA: Brooks/Cole.

Jaramillo, J. (1996). Vygotsky's sociocultural theory and contributions to the development of constructivist curricula. *Education, 117*(1), 133-141.

Jeong, A. (2003). The sequential analysis of group interaction and critical thinking in online threaded discussions. *The American Journal of Distance Education, 17*(1), 25-43.

Johnson, A., & Buchanan, T. (2001). Doing educational research on the Internet. In C. Wolfe (Ed.), *Learning and teaching on the World Wide Web* (pp. 221-242). San Diego, CA: Academic Press.

Johnson, S. (2001). Teaching introductory international relations in an entirely Web-based environment: Comparing student performance across and within groups. *Ed at a Distance, 15*(1). Retrieved from http://www.usdla.org/html/journal/JAN01_Issue/article01.html

Jonassen, D. (2000). Toward a design theory of problem solving [Electronic version]. *Educational Technology, Research and Development, 48*(4), 63-82.

Jonassen, D., Davidson, M., Collins, M., Campbell, J., & Haag, B. (1995). Constructivism and computer-mediated communication in distance education. *American Journal of Distance Education, 9*(2), 17-25.

Joo, Y., Bong, M., & Choi, H. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and Internet self-efficacy in Web-based instruction. *Educational Technology Research and Development, 48*(2), 5-17.

Joppe, M. (2003). *The Nominal Group Technique*. Retrieved October 29, 2003, from http://www.ryerson.ca/~mjoppe/ResearchProcess/841TheNominalGroupTechnique.htm

Joy, II, E., & Garcia, F. (2000). Measuring learning effectiveness: A new look at no-significant-difference findings [Electronic version]. *Journal of Asynchronous Learning Networks, 4*(1), 33-39.

Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of different types of interaction on learning achievement, satisfaction, and participation in Web-based instruction. *Innovations in Education and Teaching International, 39*(2), 153-162.

Kalton, G. (1983). *Compensating for missing survey data*. Ann Arbor: University of Michigan, Institute for Social Research.

Kaye, A. (1992). Learning together apart. In A. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden papers* (pp. 1-24). New York: Springer.

Keegan, D. (1986). *The foundations of distance education*. London: Croom Helm.

Keegan, D. (1988). Problems in defining the field of distance education. *American Journal of Distance Education, 2*(2), 56-57.

Keegan, D. (1996). *Foundations of distance education* (3rd ed.). London: Routledge.

Keirns, J. (1999). *Designs for self-instruction: Principles, processes and issues in developing self-directed learning*. Boston, MA: Allyn & Bacon.

Keller, J. (1999). Using the ARCS motivational process in computer-based instruction and distance education. *New Directions for Teaching & Learning* (78), 39-47.

Keppel, G. (1991). *Design and analysis: A researcher's handbook* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Kerlin, B. (1992). *Cognitive engagement style, self-regulated learning and cooperative learning*. Retrieved September 6, 2002, from http://www.lhbe.edu.on.ca/teach2000/onramp/srl/self_reg_learn.html

Keselman, H., Huberty, C., Lix, L., & Olejnik, S. (1998). Statistical practices of educational researchers: An analysis of their ANOVA, MANOVA, and ANCOVA analyses. *Review of Educational Research, 68*(3), 350-386.

King, F. (2001). *Asynchronous distance education courses employing web-based instruction: Implications of individual study skills self-efficacy and self-regulated learning.* Unpublished doctoral dissertation, University of Connecticut.

Knodel, J. (1993). The design and analysis of focus group studies. In D. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 35-50). Newbury Park, CA: Sage.

Kozma, R. (1994a). The influence of media on learning: The debate continues. *School Library Media Quarterly*, *22*(4). Retrieved July 28, 2003, from http://www.ala.org/ala/aasl/aaslpubsandjournals/slmrb/editorschoiceb/infopower/selectkozmahtml.htm

Kozma, R. (1994b). Will media influence learning? Reframing the debate. *Educational Technology Research and Development, 42*(2), 7-19.

Kriger, T. (2001). *A virtual revolution: Trends in the expansion of distance education*. New York: American Federation of Teachers.

Krosnick, J. (1999). Survey research [Electronic version]. *Annual Review of Psychology*, 1-37.

Krueger, R. (1993). Quality control in focus group research. In D. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 65-85). Newbury Park, CA: Sage.

Lally, V., & Barrett, E. (1999). Building a learning community on-line: Towards socio-academic interaction. *Research Papers in Education, 14*(2), 147-163.

Lauckner, K., & Lintner, M. (2001). *The computer continuum* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.

Lent, R., Hackett, G., & Brown, S. (1999). A social cognitive view of school-to-work transition [Electronic version]. *The Career Development Quarterly, 47*(4), 297-311.

Lenth, R. (2001). Some practical guidelines for effective sample size determination. *The American Statistician, 55,* 187-193.

Lewis, L., Snow, K., Farris, E., & Levin, D. (1999). *Distance education at postsecondary education institutions: 1997-98.* Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Lin, I.-F., & Schaeffer, N. (1995). Using survey participants to estimate the impact of nonparticipation. *Public Opinion Quarterly, 59,* 236-258.

Lipponen, L., Marjaana, R., Lallimo, J., & Hakkarinen, K. (2001, March). *Analyzing patterns of participation and discourse in elementary students' online science discussion.* Paper presented at the European Conference on Computer-Supported Collaborative Learning (2^{nd}), Maastricht, Netherlands.

Lister, B., Danchak, M., Scalzo, K., Jennings, W., & Wilson, J. (1999, October). *The Rensselaer 80/20 Model for interactive distance learning.* Paper presented at a meeting of EDUCAUSE '99: Celebrating New Beginnings, Long Beach, CA.

Liu, Y., & Ginther, D. (1999). Cognitive styles of distance education. *Online Journal of Distance Learning Administration, 2*(3). Retrieved from http://www.westga.edu/~distance/liu23.html.

Liu, Y., Lavelle, E., & Andris, J. (2002). Experimental effects of online instruction on locus of control. *United States Distance Learning Association Journal, 16*(6). Retrieved from http://www.usdla.org/html/journal/JUN02_Issue/article02.html

Loomis, K. (2000). Learning styles and asynchronous learning: Comparing the LASSI model to class performance. *Journal of Asynchronous Learning Networks, 4*(1), 1-9.

Mason, R. (2000). From distance education to online education. *Internet and Higher Education, 3*, 63-74.

Matthews, D. (1999). The origins of distance education and its use in the United States. *T.H.E. Journal*. Retrieved June 8, 2002, from http://www.thejournal.com/magazine/vault/A2222.cfm

Maxwell, S., & Delaney, H. (2000). *Designing experiments and analyzing data: A model comparison perspective*. Mahway, NJ: Erlbaum.

McAdoo, M. (2000). The real digital divide: Quality not quantity. In D. Gordon (Ed.), *The digital classroom: How technology is changing the way we teach and learn* (pp. 143-153). Cambridge, MA: Harvard Education Letter.

McClelland, S. (1995). *Organizational needs assessments: Design, facilitation, and analysis*. Westport, CT: Quorum Books.

McDonald, J. (2002). Is "as good as face-to-face" as good as it gets? *Journal of Asynchronous Learning Networks, 6*(2), 10-23.

McElhatton, T. (2002). Lesson about e-learning. *Tech Live: Tech News and Information.* Retrieved June 8, 2002, from http://techtv.com/news/culture/story/0,24195,3378832,00.html

McIsaac, M., & Gunawardena, C. (1996). Distance education. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 403-437). New York: Simon & Schuster Macmillan.

McKeachie, W. (1995). Learning styles can become learning strategies [Electronic version]. *National Teaching & Learning Forum, 4*(6), 1-4.

McLoughlin, C., & Luca, J. (2002). *Enhancing the quality of the student experience online: Revisiting the imperative of learning as socially based.* Paper presented at the annual International Conference of the Higher Education Research and Development Society of Australasia, Perth, Western Australia.

McManus, T. (2000). Individualizing instruction in a Web-based hypermedia learning environment: Nonlinearity, advance organizers, and self-regulated learners. *Journal of Interactive Learning Research, 11*(3), 219-251.

Merisotis, J. (1999). The "what's-the-difference?" debate. *Academe, 85*(5), 47-51.

Merisotis, J., & Phipps, R. (1999). What's the difference? *Change, 31*(3), 12-17.

Mertler, C. (2003). Patterns of response and nonresponse from teachers to traditional and web surveys. *Practical Assessment, Research & Evaluation, 8*(22). Retrieved from http://pareonline.net/getvn.asp?v=8&n=22

Meyer, K. (2002). Quality in distance learning. *ASHE-ERIC Higher Education Reports, 29*(4), 1-121.

Meyer-Peyton, L. (2000). Elements of a successful distributed learning program. In L. Lau (Ed.), *Distance learning technologies: Issues, trends and opportunities* (pp. 82-90). Hershey, PA: Idea.

Miller, M., Rainer, J., R., & Corley, J. (2003). Predictors of engagement and participation in an on-line course. *Online Journal of Distance Learning Administration, 6*(1). Retrieved April 28, 2004, from http://www.westga.edu/~distance/ojdla/spring61/miller651.htm

Miltiadou, M., & Chong, H. (2001). *Validation of the online technologies self-efficacy scale (OTSES).* Retrieved from the Arizona State University Web site: http://pareonline.net/getvn.asp?v=8&n=22

Miltiadou, M., & Savenye, W. (2003). Applying social cognitive constructs of motivation to enhance student success in online distance education. *Educational Technology Review, 11*(1), 3-30.

Moan, E., & Dereshiwsky, M. (2002). Identifying factors that predict student engagement in web-based coursework. *United Distance Learning Association Journal, 16*(1). Retrieved from http://www.usdla.org/html/journal/JAN02_Issue/article05.html

Moore, G. (1991). Computer to computer: Mentoring possibilities. *Educational Leadership, 49*(3), 40-42.

Moore, M. (1973). Toward a theory of independent learning and teaching. *Journal of Higher Education, 44*(12), 661-679.

Moore, M. (1989). Editorial: Three types of interaction. *American Journal of Distance Education, 3*(2), 1-6.

Moore, M. (1991). Editorial: Distance education theory. *American Journal of Distance Education, 5*(3). Retrieved from http://www.ajde.com/Contents/vol5_3.htm

Moore, M. (1993). Editorial: Is teaching like flying? A total systems view of distance education. *American Journal of Distance Education, 7*(1). Retrieved from http://www.ajde.com/Contents/vol7_1.htm

Moore, M. (1994). Editorial: Autonomy and interdependence. *American Journal of Distance Education, 8*(2). Retrieved from http://www.ajde.com/Contents/vol8_2.htm

Moore, M., & Thompson, M. (1990). *The effects of distance learning: A summary of literature* [Monograph]. (ERIC Document Reproduction Service No. ED330321)

Morgan, D. (Ed.). (1993). *Successful focus groups: Advancing the state of the art.* Newbury Park, CA: Sage.

Morgan, D., & Krueger, R. (1993). When to use focus groups and why. In D. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 3-19). Newbury Park, CA: Sage.

Morrison, J. (1999). The role of technology in education today and tomorrow: An interview with Kenneth Green. *On the Horizon, 6*(5). Retrieved June 7, 2003, from http://www.campuscomputing.net/archive/horizon/interview.html

National Education Association. (2000a). *A survey of traditional and distance learning higher education members*. Washington, DC. Retrieved June 2, 2003, from http://www.nea.org/he/abouthe/dlstudy.pdf

National Education Association. (2000b). Distance education at postsecondary education institutions: 1997-98 [Electronic version]. *NEA Higher Education Research Center Update, 6*(2), 1-6.

Neal, E. (1999). Distance education [Electronic version]. *National Forum, 79*(1), 1-4.

Nguyen, D.-D., & Kira, D. (2000). Summative and formative evaluations of Internet-based teaching. In L. Lau (Ed.), *Distance learning technologies: Issues, trends and opportunities* (pp. 22-38). Hershey, PA: Idea.

Niemczyk, M., & Savenye, W. (2001, November). *The effect of student self-regulation activities on performance in a computer literacy course.* Paper presented at the Association for Educational Communications and Technology, LaGuardia, NY.

Nipper, S. (1989). Third generation distance learning and computer conferencing. In R. Mason & A. Kaye (Eds.), *Mindweave: Communication, computers and distance education* (pp. 63-73). Oxford, UK: Pergamon Press.

Norton, P., & Wiburg, K. (1998). *Teaching with technology*. Belmont, CA: Wadsworth/Thomson Learning.

O'Hanlon, N. (2001). Development, delivery, and outcomes of a distance course for new college students. *Library Trends, 50*(1), 8-27.

Olcott, J., Don. (1999). Instructional technologies, part two: strategies for instructor success: selecting and using distance education technologies. In M. Boaz, et al (Ed.), *Teaching at a distance: A handbook for instructors* (pp. 31-39). Monterey, CA: Archipelago Productions.

Olejnik, S. (1984). Planning educational research: Determining the necessary sample size. *Journal of Experimental Education, 53*(1), 40-48.

Olejnik, S., & Algina, J. (2003). Generalized eta and omega squared statistics: Measures of effect size for some common research designs. *Psychological Methods, 8*(4), 434-447.

Olejnik, S., & Hess, B. (1997). Top ten reasons why most omnibus ANOVA *F*-tests should be abandoned. *Journal of Vocational Education Research, 22*(4), 219-232.

Oliver, J., & Hinkle, D. (1982). Occupational education research: Selecting statistical procedures. *Journal of Studies in Technical Careers, 4*(3), 199-208.

Oppenheim, A. (1992). *Questionnaire design, interviewing and attitude measurement*. London: Cassell.

Ornstein, A., & Hunkins, F. (1998). *Curriculum: Foundations, principles, and issues* (3rd ed.). Needham Heights, MA: Allyn & Bacon.

Osika, E., & Sharp, D. (2002). Minimum technical competencies for distance learning students. *Journal of Research on Technology in Education, 34*(3), 318-325.

Pajares, F. (1996). Self-efficacy beliefs and mathematical problem-solving of gifted students. *Contemporary Educational Psychology, 21*, 325-344.

Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning [Electronic version]. *Theory Into Practice, 41*(2), 116-125.

Pajares, F., Hartley, J., & Valiante, G. (2001). Response format in writing self-efficacy assessment: Greater discrimination increases prediction. *Measurement and Evaluation in Counseling and Development, 33*, 214-221.

Park, O.-C. (1998). Visual displays and contextual presentations in computer-based instruction. *Educational Technology Research and Development, 46*(3), 37-50.

Passerini, K., & Granger, M. (2000). A developmental model for distance learning using the Internet. *Computers & Education, 34*(1), 1-15.

Petrides, L. (2002). Web-based technologies for distributed (or distance) learning: Creating learning-centered educational experiences in the higher education classroom. *International Journal of Instructional Media, 29*(1), 69-77.

Phillips, G., Santoro, G., & Kuehn, S. (1988). The use of computer-mediated communications in training students in group problem-solving and decision-making techniques. *American Journal of Distance Education, 2*(1), 38-51.

Phipps, R., & Merisotis, J. (1999). *What's the difference? A review of contemporary research on the defectiveness of distance learning in higher education*. Washington, DC: Institute for Higher Education Policy.

Phipps, R., & Merisotis, J. (2000). *Quality on the line: Benchmarks for success in Internet-based distance education*. Washington, DC: Institute for Higher Education Policy.

Piaget, J. (1985). *The equilibration of cognitive structures: The central problem of intellectual development* (T. Brown & K. Thampy, Trans.). Chicago: University of Chicago Press.

Picciano, A. (1998). Developing an asynchronous course model at a large, urban university [Electronic version]. *Journal of Asynchronous Learning Networks, 2*(1), 1-14.

Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks, 6*(1), 19.

Pietsch, J. (2003). The relationship among self-concept, self efficacy, and performance in mathematics during secondary school [Electronic version]. *Journal of Educational Psychology, 95*(3), 589-603.

Pilkington, R., Bennett, C., & Vaughan, S. (2000). An evaluation of computer mediated communication to support group discussion in continuing education. *Educational Technology & Society, 3*(3), 349-360.

Pintrich, P. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory Into Practice, 41*(4), 219-225.

Pintrich, P., & De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33-40.

Pintrich, P., Smith, D., Garcia, T., & McKeachie, W. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).* Ann Arbor: University of Michigan. (ERIC Document Reproduction Service No. ED338122).

Poscente, K. (2002, May). *Text-based CMC conferencing: An approach for analysis.* Paper presented at the International Symposium on Educational Conferencing, Banff, Alberta.

Prammanee, N. (2003). *Understanding participation in online courses: A case study of perceptions of online interaction* [Electronic version] (ITForum Paper No. 68). DeKalb: Northern Illinois University.

Prewitt, T. (1998). The development of distance learning delivery systems. *Higher Education in Europe, 23*(2), 187-194.

Public Broadcasting Service (PBS) distance learning week: Timeline. (n.d.). Retrieved May 10, 2003, from http://www.pbs.org/als/dlweek/history/

Ratner, S., & Altman, J. (Eds.). (1964). *John Dewey and Arthur F. Bentley: A philosophical correspondence, 1932-1951*. New Brunswick, NJ: Rutgers University Press.

Reeves, T. (1997). *Evaluating what really matters in computer-based education*. Retrieved October 26, 2002, from http://www.educationau.edu.au/archives/cp/reeves.htm

Reiser, R. (2001). A history of instructional design and technology: Part II: A history of instructional design. *Educational Technology Research and Development (ETR&D), 49*(2), 57-67.

Reiser, R., & Gagne, R. (1983). *Selecting media for instruction.* Englewood Cliffs, NJ: Educational Technology Publications.

Richards, J., & Anderson, N. (2003). What do I see? What do I think? What do I wonder? (STW): A visual literacy strategy to help emergent readers focus on storybook illustrations. *Reading Teacher, 56*(5), 442-444.

Richardson, J., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68-88.

Riva, G. (2001). From real to virtual communities: Cognition, knowledge and interaction in the World Wide Web. In C. R. Wolfe (Ed.), *Learning and teaching on the World Wide Web* (pp. 131-148). San Diego, CA: Academic Press.

Riva, G., & Galimberti, C. (1997). The psychology of cyberspace: A socio-cognitive framework to computer-mediated communication [Electronic version]. *New Ideas in Psychology, 15*(2), 141-158.

Rockwell, K., Furgason, J., & Marx, D. (2000). Research and evaluation needs for distance education: A Delphi study. *Online Journal of Distance Learning Administration, 3*(3). Retrieved from http://www.westga.edu/~distance/ojdla/fall33/rockwell33.html

Rojewski, J. (1997). The recent and extended past of the JVER–understanding directions and establishing the context for dialogue. *Journal of Vocational Educational Research, 22*(4), 211-218.

Rosenkrans, G. (2001). Design considerations for an effective online environment. *Journalism & Mass Communication Educator, 56*(1), 43-61.

Rosenthal, R., & Rosnow, R. (1975). *The volunteer subject*. New York: Wiley.

Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1-28.

Rotter, J. (1990). Internal versus external control of reinforcement: A case history of a variable. *American Psychologist, 45*(4), 489-493.

Rourke, L., Anderson, T., Garrison, D., & Archer, W. (1999). Assessing social presence in asynchronous text-based computer conferencing [Electronic version]. *Journal of Distance Education, 14*(3), 51-70.

Rourke, L., Anderson, T., Garrison, D., & Archer, W. (2000). Methodological issues in the content analysis of computer conference transcripts [Electronic version]. *International Journal of Artificial Intelligence in Education, 11*(3), 1-18.

Rushen, S. (1995). The dead in the classroom. *Annals of Improbable Research, 1*(2), 175-176.

Russell, T. (1999). *The no significant difference phenomenon*: International Distance Education Certification Center (http://www.idecc.org/).

Saba, F. (1988). Integrated telecommunications systems and instructional transaction. *American Journal of Distance Education, 2*(3), 17-24.

Saba, F. (1998). Is distance education comparable to "traditional education"? *Distance Education Report*, 2. Retrieved June 2, 2003, from http://www.distance-educator.com/der/comparable.html

Sankaran, S., & Bui, T. (2001). Impact of learning strategies and motivation on performance: A study in Web-based instruction [Electronic version]. *Journal of Instructional Psychology, 28*(3), 191-198.

Schank, P., Fenton, J., Schlager, M., & Fusco, J. (1999). *From MOO to MEOW: Domesticating technology for online communities.* Paper presented at the International Conference on Computer Support for Collaborative Learning (3rd), Stanford University, CA.

Schlosser, C., & Anderson, M. (1994). *Distance education: Review of the literature*. Washington, DC: Iowa Distance Education Alliance. (ERIC Document Reproduction Service No. 382159 ISBN-0-89240-071-4)

Schrum, L. (1991). Teacher education goes online [Electronic version]. *Educational Leadership, 49*(3), 39, 41-42.

Schrum, L. (2000a). Guarding the promise of online learning. *Education Digest, 66*(4), 43-47.

Schrum, L. (2000b). Online learning in the academy: The conundrum that may divide us. *Technos, 9*(3), 34-36.

Schrum, L. (2002). Oh what wonders you will see: Distance education past, present, and future. *Learning and Leading with Technology, 30*(3), 6-9, 20-21.

Schunk, D. (1990). Goal setting and self-efficacy. *Educational Psychologist, 25*(1), 71-86.

Schunk, D., & Zimmerman, B. (1997). Social origins of self-regulatory competence. *Educational Psychologist, 32*(4), 195-208.

Schutte, J. (1996). *Virtual teaching in higher education: The new intellectual superhighway of just another traffic jam?* Retrieved June 6, 2003, from http://www.csun.edu/sociology/virexp.htm

Scientific Software International, Inc. (2000). *Positive Definite Matrices*. Retrieved May 30, 2004, from http://www.ssicentral.com/lisrel/posdef.htm

Scott, J., & Sarkees-Wircenski, M. (1996). *Overview of vocational and applied technology education*. Homewood, IL: American Technical.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday/Currency.

Sherry, L. (1996). Issues in distance learning. *International Journal of Educational Telecommunications, 1*(4), 337-365.

Sherry, L. (1997, October 5). *What curriculum for the information age: A retrospective view.* Retrieved May 16, 2003, from http://carbon.cudenver.edu/~lsherry/courses/mawhite.html

Sims, R., Dobbs, G., & Hand, T. (2002). Enhancing quality in online learning: Scaffolding planning and design through proactive evaluation. *Distance Education, 23*(2), 135-148.

Smith, K. (1997). Preparing faculty for instructional technology: From education to development to creative independence. *Cause/Effect, 20*(3), 36-48.

Spiceland, J., & Hawkins, C. (2002). The impact on learning of an asynchronous active learning course format. *Journal of Asynchronous Learning Networks, 6*(1). Retrieved from http://www.sloan-c.org/publications/jaln/v6n1/v6n1_spiceland.asp

Spring, J. (1998). *Education and the rise of the global economy*. Mahwah, NJ: Erlbaum.

Stafford, B. (1997). Think again: The intellectual side of images. *Chronicle of Higher Education, 43*(41), B6-B7.

Stallings, D. (2000). The virtual university: Legitimized at century's end: Future uncertain for the new millennium. *Journal of Academic Librarianship, 26*(1), 3-14.

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research & Evaluation, 7*(17). Retrieved June 20, 2004, from http://pareonline.net/getvn.asp?v=7&n=17

Stenning, K., McKendree, J., Lee, J., & Cox, R. (1999). *Proceedings of the computer support for collaborative learning (CSCL) 1999 conference*. Retrieved October 3, 2003, from http://kn.cilt.org/cscl99/A43/A43.HTM

Stewart, C., Shields, S., Monolescu, D., & Taylor, J. (1999). Gender participation in synchronous CMC: An IRC case study. *Interpersonal Computing and Technology, 7*(1-2). Retrieved April 14, 2002, from http://www.emoderators.com/ipet-j/1999/n1-2/stewart.htm

Strickland, B. (1989). Internal-external control expectancies: From contingency to creativity. *American Psychologist, 44*(1), 1-12.

Swan, M., & Jackman, D. (2000). Comparing the success of students enrolled in distance education courses vs. face-to-face classrooms. *Journal of Technology Studies, 26*(1), 58-63.

Tallman, F. (1994). Satisfaction and completion in correspondence study: The influence of instructional and student-support services. *The American Journal of Distance Education, 8*(2). Retrieved from http://www.ajde.com/Contents/vol8_2.htm

Tam, M. (2000). Constructivism, international design, and technology: Implications for transforming distance learning. *Educational Technology & Society, 3*(2), 1-17.

Taylor, J. (1995). Distance education technologies: The fourth generation. *Australian Journal of Educational Technology, 11*(2), 1-7.

Taylor, J. (2002, September). *Fifth generation distance education*. Retrieved May 12, 2003, from http://www.icde.org

Thompson, B. (1999, April). *Common methodology mistakes in educational research, revisited, along with a primer on both effect sizes and the bootstrap.* Paper presented at the American Educational Research Association, Montreal.

Thorpe, M. (1998). Assessment and 'third generation' distance education. *Distance Education, 19*(2), 265-286.

Tucker, S. (2001). Distance education: Better, worse, or as good as traditional education? *Online Journal of Distance Learning Administration, 4*(4). Retrieved May 24, 2003, from http://www.westga.edu/~distance/ojdla/winter44/tucker44.html

Turoff, M. (1997, April 27). *Alternative futures for distance learning: The force and the darkside.* Paper presented at the UNESCO/Open University International Colloquium, Milton Keynes, UK. Retrieved May 13, 2003, from http://eies.njit.edu/~turoff/Papers/darkaln.html

Valenta, A., Therriault, D., Dieter, M., & Mrtek, R. (2001). Identifying student attitudes and learning styles in distance education. *Journal of Asynchronous Learning Networks, 5*(2). Retrieved from http://www.aln.org/alnweb/journal/Vol5_issue2/Valenta/Valenta.htm

Van Kekerix, M., & Andrews, J. (1991). Electronic media and independent study. In B. Watkins & S. Wright (Eds.), *The Foundations of American Distance Education: A Century of Collegiate Correspondence Study* (pp. 135-157). Dubuque, IA: Kendall/Hunt.

Vispoel, W., & Chen, P. (1990). *Measuring self-efficacy: The state of the art.* Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Visser, L., Plomp, T., Amirault, R., & Kuiper, W. (2002). Motivating students at a distance: The case of an international audience [Electronic version]. *Educational Technology Research and Development, 50*(2), 94-107.

Vrasidas, C. (2002). Systematic approach for designing hypermedia environments for teaching and learning [Electronic version]. *International Journal of Instructional Media, 29*(1), 13-25.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Waits, T., & Lewis, L. (2003). *Distance education at degree-granting postsecondary institutions: 2000-2001*. Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Wang, A., & Newlin, M. (2000). Characteristics of students who enroll and succeed in psychology Web-based classes. *Journal of Educational Psychology, 92*(1), 137-143.

Wang, S. (1994). Basic considerations of distance education programs. *International Journal of Instructional Media, 21*(1), 53-60.

Watkins, B., & Wright, S. (Eds.). (1991). *The foundations of American distance education: A century of collegiate correspondence study*. Dubuque, IA: Kendall/Hunt.

Web-based Education Commission. (2000). *The Power of the Internet for learning: Moving from promise to practice*. Washington, DC: Author. Retrieved from http://www.hpcnet.org/webcommission

Wegner, S., Holloway, K., & Garton, E. (1999). The effects of Internet-based instruction on student learning. *Journal of Asynchronous Learning Networks, 3*(2), 98-106.

Wells, J. (2000). Effects of an on-line computer-mediated communication course, prior computer experience and Internet knowledge, and learning styles on students' Internet attitudes computer-mediated technologies and new educational challenges. *Journal of Industrial Teacher Education, 37*(3). Retrieved from http://scholar.lib.vt.edu/ejournals/JITE/v37n3/wells.html

Winne, P. (1995a). Inherent details in self-regulated learning. *Educational Psychologist, 30*(4), 173-187.

Winne, P. (1995b). Self-regulation is ubiquitous but its forms vary with knowledge. *Educational Psychologist, 30*(4), 223-228.

Wolfe, C. (Ed.). (2001). *Learning and teaching on the World Wide Web*. San Diego, CA: Academic Press.

Wu, D., & Hiltz, S. (2004). Predicting learning from asynchronous online discussions. *Journal of Asynchronous Learning Networks, 8*(2), 139-152.

Yu, C.-H. (2001, April). *An introduction to computing and interpreting Cronbach coefficient alpha in SAS (Paper 246-26).* Paper presented at the SAS Users Group International (SUGI 26), Long Beach, CA.

Zimmerman, B. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, *81*(3), 329-339.

Zimmerman, B. (1995). Self-regulation involves more than metacognition: A social cognitive perspective. *Educational Psychologist, 30*(4), 217-221.

Zimmerman, B. (1998). Academic studying and the development of personal skill: A self-regulatory perspective. *Educational Psychologist, 33*(2/3), 73-86.

Zimmerman, B. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64-67.

Zimmerman, B., & Kitsantas, A. (1999). Acquiring writing revision skill: Shifting from process to outcome self-regulatory goals. *Journal of Educational Psychology*, *91*(2), 241-250.

Zimmerman, B., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology*, *82*(1), 51-59.

APPENDIX A

ORIGINAL ONLINE CONSENT FORM

Dear Survey Participant:

My name is **Nancy P. Robinson** with the **Department of Occupational Studies (706) 542-1682**. I am a doctoral student under the direction of Dr. Roger B. Hill, Department of Occupational Studies (706) 542-4100 at The University of Georgia. I am currently conducting a study to examine students' learning and satisfaction with online distance education. I am trying to determine a profile of learner characteristics in an online classroom environment.

If you agree to take part in this study, over the course of the semester, you will be asked to complete two questionnaires. The first questionnaire is related to your confidence in using Web course tools and your study skills used for your online course. The second questionnaire is related to your satisfaction with your online course. In addition, your class participation will be analyzed to observe patterns and structural features of online discussions. You will receive feedback on your study skills and learning strategies that may be beneficial for improving your study skills during the semester.

Your participation is entirely voluntary and not related in any way to your grade in this class. You may decide to participate now, but you can withdraw from the study at any time during the course of the semester without penalty, and the results of your participation will be removed from the research records or destroyed.

Synchronous (instantaneous) sessions may be recorded as sound files in order to determine levels of participation in online discussions. Only the patterns of interaction and structural features of discussions, such as threaded discussions, will be documented. Any data will be coded to remove all identifiers of participants. You will have the right to review/edit the tapes. They will only be used for educational purposes and will be destroyed at the conclusion of this study.

The results of your participation will be **confidential** and will not be released in any individually identifiable form. There is a limit to the confidentiality that can be guaranteed due to the technology itself. The technology I am referring to is the Internet. No information about you, or provided by you during the research, will be shared with others without your written permission, except if necessary to protect your rights or welfare (for example, if you are injured and need emergency care); or if required by law.


Your e-mail address will only be used to eliminate duplicate entries and to inform you if you have **won the lottery**. It will take an estimated time of 15 minutes to complete both surveys. Yes! Each participant who has completed both surveys will be assigned a number and will be **eligible for a $100.00 gift certificate to Amazon.com**. There will be one entry for each participant. One number will be chosen at random at the end of April 2004, and you will receive notification by WebCT e-mail that you have the winning number!

Entering your password to the linked surveys indicates that the researcher has answered all of your questions to your satisfaction and that you consent to volunteer for this study. You can print a copy of this form for your records.

I am asking you to please volunteer a few minutes of your time to complete the linked questionnaires dealing with online satisfaction and online self-efficacy and learning strategies. I will answer any further questions about the research, now or during the course of the project, and can be reached by my home telephone at: [phone number].

Thank you for your help and cooperation.

Nancy Pliska Robinson
Department of Occupational Studies
The University of Georgia, Athens, GA
http://nprzone.com
npr@nprzone.com
npr@uga.edu

Additional questions or problems regarding your rights as a research participant should be addressed to Chris A. Joseph, Ph.D. Human Subjects Office, University of Georgia, 606A Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-mail Address IRB@uga.edu

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Your Information	
Enter Your UGA Email Address	
Enter Survey Password	
Take me to the Survey	

APPENDIX B

ORIGINAL ONLINE SELF-EFFICACY AND LEARING STRATEGIES SURVEY

nprzone.com

Online Satisfaction and Learning Strategies Surveys

I am interested in investigating your confidence in using Web course tools (e-mail, bulletin board, and chat) and in understanding how you learn in an online distance education environment. This information will be very helpful in developing a profile of learners' characteristics in an online course. After completing the entire survey, you will receive feedback on your study habits and learning skills.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however you may skip any questions you feel uncomfortable answering.

Remember to click the **Submit** button when you have completed this section. This will take you to the **Final Section -- Learning Strategies.** It is important that you **complete both sections**.

First, some basic questions about yourself . . .

1 How many classes are you taking this semester? *Please enter a number.*

2 What is your age as of your last birthday? *Please enter a number.*

3 How many online courses have you previously taken? *Please enter a number.*

4 What is your highest degree held at time of registration for this online course(s)?

F Bachelor's degree F Master's degree F Doctorate F Other

5 Do you own a computer?

F Yes F No

6 Do you have access to a computer when you are **not** in school or at work?

F Yes F No

7 Are you male or female?

F Male F Female

Computer experience: Prior to taking this course, what was your level of experience with . . .	**(1) None**	**(2) Beginner** (Knows a few operations)	**(3) Competent** (Knows basic operations in all categories)	**(4) Expert** (Can teach others)
8 word-processing (create, edit, save, print documents)?	○	○	○	○
9 e-mail (compose, edit, send, receive)?	○	○	○	○
10 browsing and searching on the Word	○	○	○	○

	Wide Web (WWW)?					
11	accessing library resources using the WWW?	○	○	○		○
12	presentation software (e.g., PowerPoint)?	○	○	○		○
13	creating Web pages with Web authoring software (e.g., Dreamweaver)?	○	○	○		○

Online Self-efficacy (your confidence in using Web course tools): **Using the WWW, how confident do you feel . . .**		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
14	accessing a Web browser (e.g. Netscape or Internet Explorer)?	○	○	○	○	○
15	using menus/navigational buttons?	○	○	○	○	○
16	clicking on a link to a specific Web site?	○	○	○	○	○
17	entering a URL to access a Web site?	○	○	○	○	○
18	creating a bookmark to favorite Web sites?	○	○	○	○	○
19	conducting a search on the Web by using words or phrases used in the course?	○	○	○	○	○
20	printing a Web site?	○	○	○	○	○
21	downloading (saving) Web material to a hard drive or disk?	○	○	○	○	○

Using bulletin/discussion board features, how confident do you feel . . .		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
22	posting a new message (creating a thread)?	○	○	○	○	○
23	reading topics in chronological order or by thread (subject)?	○	○	○	○	○
24	replying to a topic for viewing by all members of the discussion?	○	○	○	○	○
25	uploading a file to a posting or reply?	○	○	○	○	○

Using e-mail to communicate with instructor(s) or other students, how confident do you feel . . .		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
26	sending e-mail to a specific student?	○	○	○	○	○
27	sending e-mail to several students at one	○	○	○	○	○

	time?					
28	replying to e-mail messages?	○	○	○	○	○
29	attaching text or image files to your e-mail?	○	○	○	○	○
Creating a Web page for a course, how confident do you feel . . .		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
30	creating Web pages with Web authoring software (e.g. Dreamweaver?)	○	○	○	○	○
31	adding graphics to your Web page?	○	○	○	○	○
32	adding hyperlinks to your Web page?	○	○	○	○	○
33	uploading your Web page to a server through FTP (file transfer protocol)?	○	○	○	○	○
Participating in a "live" (synchronous) chat session, how confident do you feel. . .		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
34	reading messages from one or more students?	○	○	○	○	○
35	answering a message or providing your own message?	○	○	○	○	○
36	interacting privately with one other student or the instructor?	○	○	○	○	○

- Click the Submit button to go to the *Final Section* -

Submit

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Online Self-efficacy and Learning Strategies Survey

Final Section

This final section relates to how you learn in an online distance education environment. After completing this final section, you will receive feedback on your study habits and learning skills.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however, you may skip any questions you feel uncomfortable answering. Feel free to provide comments in the last section if you want.

Remember to click the **Submit** button when you have completed this section.

	Learning Strategies: When you study for this class, how true are these statements about you?	**(1) Not at all true of me**	**(2) Rarely true of me**	**(3) Sometimes true of me**	**(4) Often true of me**	**(5) Always true of me**
1	During online sessions, I often miss important points because I'm thinking of other things.	1. ○	2. ○	3. ○	4. ○	5. ○
2	When studying, I often try to explain the material to a classmate or friend.	1. ○	2. ○	3. ○	4. ○	5. ○
3	I usually study in a place where I can concentrate on my course work.	1. ○	2. ○	3. ○	4. ○	5. ○
4	When reading, I make up questions to help focus on the material?	1. ○	2. ○	3. ○	4. ○	5. ○
5	I often feel so lazy or bored when I study that I quit before I finish what I planned to do.	1. ○	2. ○	3. ○	4. ○	5. ○
6	Even if I have trouble learning the material in this course, I try to the work on my own, without help from anyone.	1. ○	2. ○	3. ○	4. ○	5. ○
7	When I become confused about something I'm reading for this course, I go back and try to figure it out.	1. ○	2. ○	3 ○.	4 ○.	5 ○.
8	I make good use of my study time for this course.	1. ○	2 ○.	3 ○.	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
9	If course readings are difficult to understand, I change the way I read the material.	1. ○	2. ○	3 ○.	4. ○	5. ○
10	I try to work with other students from this course online or by e-mail to complete the course assignments.	1. ○	2. ○	3 ○.	4. ○	5. ○
11	I work hard to do well in this course even if I don't like what we are doing.	1. ○	2 ○.	3 ○.	4. ○	5. ○
12	When studying, I often set aside time to discuss course material online with a group of students from the class.	1. ○	2. ○	3. ○	4. ○	5. ○
13	I find it hard to stick to a study schedule.	1. ○	2. ○	3. ○	4. ○	5. ○
14	Before I study new course material thoroughly, I often skim it to see how it is organized.	1. ○	2. ○	3. ○	4 ○.	5. ○
15	I ask myself questions to make sure I understand the material I have been studying in this class.	1. ○	2. ○	3. ○	4. ○	5. ○
16	I try to change the way I study in order to fit the course requirements and the instructor's teaching style.	1. ○	2. ○	3. ○	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
17	I often find that I have been reading for this course but don't know what it was all about.	1. ○	2. ○	3. ○	4. ○	5. ○
18	I e-mail or call the instructor to clarify concepts I don't understand well.	1. ○	2. ○	3. ○	4. ○	5. ○
19	When course work is difficult, I either give up or only study the easy parts.	1. ○	2. ○	3. ○	4. ○	5. ○
20	I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.	1. ○	2. ○	3. ○	4. ○	5. ○
21	I have a regular place set aside for studying.	1. ○	2. ○	3. ○	4. ○	5. ○

22	When I can't understand the material in this course, I e-mail another student in this class for help.	1. ○	2. ○	3. ○	4. ○	5. ○
23	I make sure that I keep up with the daily or weekly readings, discussions, and assignments for this course.	1. ○	2. ○	3. ○	4. ○	5. ○
24	I log on to this course to monitor new discussion postings and e-mail on a daily basis.	1. ○	2. ○	3. ○	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
25	Even when course materials are dull and uninteresting, I manage to keep working until I finish.	1. ○	2. ○	3. ○	4. ○	5. ○
26	I try to identify students in this class whom I can e-mail for help if necessary.	1. ○	2. ○	3. ○	4. ○	5. ○
27	When studying for this course, I try to determine which concepts I don't understand well.	1. ○	2. ○	3. ○	4. ○	5. ○
28	I often find that I don't spend very much time on this course because of other activities.	1. ○	2. ○	3. ○	4. ○	5. ○
29	When I study for this class, I set goals for myself in order to direct my activities in each study period.	1. ○	2. ○	3. ○	4. ○	5. ○
30	If I get confused during an online session or while making notes, I make sure I sort it out afterwards.	1. ○	2. ○	3. ○	4. ○	5. ○
31	I rarely find time to review my notes, discussions, or material before an exam.	1. ○	2. ○	3. ○	4. ○	5. ○
32	Additional comments about your online course experience . . .					

Submit Reset

This section (31 questions) of the Online Self-efficacy and Learning Strategies Survey is a modification of the MSLQ (Motivated Strategies for Learning Questionnaire) developed by Pintrich, Smith, Garcia, & McKeachie, 1991) ***NPliksaRobinson 2003***

APPENDIX C

ORIGINAL ONLINE SATISFACTION SURVEY

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Online Satisfaction Survey

I am interested investigating your satisfaction with what you feel has been accomplished in your online distance education course. This information will be very helpful in developing a profile of learners' characteristics in an online course. The items in this survey have been designed to determine your level of **satisfaction** from ***Very Unsatisfied (1)*** **to** ***Very Satisfied (4)*** with your online experience.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however, you may skip any questions you feel uncomfortable answering. Feel free to provide comments in the last section if you want.

Remember to click the **Submit** button when you have completed the survey.

First some basic questions about yourself . . .

1 How many online courses have you previously taken? *Please enter a number.*

2 What is your age as of your last birthday? *Please enter a number.*

3 What is your highest degree held at time of registration for online course(s)?

○ Bachelor's degree ○ Master's degree ○ Doctorate ○ Other

4 What is your major?

○ Education ○ Other

5 Are you male or female?

○ Male ○ Female

How satisfied were you in your online course with regard to...	(1) Very Unsatisfied	(2) Unsatisfied	(3) Satisfied	(4) Very Satisfied
6 availability of course syllabus?	1. ○	2. ○	3. ○	4. ○
7 availability of assignments?	1. ○	2. ○	3. ○	4. ○
8 availability of other course content (objectives, calendar)?	1. ○	2. ○	3. ○	4. ○
9 access to instructor (via e-mail or phone)?	1. ○	2. ○	3. ○	4. ○

10	organization of assignments and course content?	1. ○	2. ○	3. ○	4. ○
11	ease-of-use (with content, navigation, etc.)?	1. ○	2. ○	3. ○	4. ○
12	submitting assignments from anywhere?	1. ○	2. ○	3. ○	4. ○
13	taking quizzes remotely (off campus)?	1. ○	2. ○	3. ○	4. ○
14	receiving feedback about questions and assignments from the instructor?	1. ○	2. ○	3. ○	4. ○
15	instructor encouraging high standards of performance?	1. ○	2. ○	3. ○	4. ○
16	your own performance in this course?	1. ○	2. ○	3. ○	4. ○
17	your overall online experience in this course?	1. ○	2. ○	3. ○	4. ○
18	amount of interaction with classmates?	1. ○	2. ○	3. ○	4. ○
19	ability to provide insightful reactions to classmate's opinions and ideas?	1. ○	2. ○	3. ○	4. ○
20	supportive comments in chat room discussions?	1. ○	2. ○	3. ○	4. ○
21	access to technical support (via e-mail or phone)?	1. ○	2. ○	3. ○	4. ○
22	access to course tool's Help files?	1. ○	2. ○	3. ○	4. ○
23	**Additional comments to explain your level of satisfaction with your online course experience . . .**				

Submit Reset

APPENDIX D

PANEL REIVEW AND REVIEW CRITERIA

Instrument Validity: Panel Review Members and Results of Review

Round 1 Panel Review Members		
Panel Members	Organization	Area of Expertise
Dr. Rob Branch	University of Georgia	Instructional Technology
Dr. Helen Hall	University of Georgia	Occupational Studies
Dr. Roger Hill	University of Georgia	Occupational Studies
Dr. Jay Rojewski	University of Georgia	Occupational Studies
Dr. Robert Wicklein	University of Georgia	Occupational Studies
Initial Review Results		
Self-Efficacy and Learning Strategies Survey:		
Define Web course tools in beginning paragraph so that all respondents will interpret correctly. Bold in 2nd paragraph, "Your responses will have absolutely no bearing on your course grade." Item 14: Make parenthetical statement the same color (red) as other statements. Clarify that Final Section Items #1, 5, 6, 13, 17, 19, 28, and 31 are reversed scale items and have been coded accordingly. Monitor data sets in Final Section where more than half of the respondents have selected the 3rd category, "Sometimes true of me." Correct typing in Item 26 of Final Section. Restrict table width to 750 pixels to prevent resizing instruments. Favorable response to open-ended options.		
Satisfaction Survey:		
Favorable response to forced-choice scale. Item 4: Change 'Other' radio button to a text field. However, it was decided that 2 different types of buttons for the same item would be confusing to respondents and there would probably be relatively few responses in this category anyway. Label the scale with words to provide some type of definition for each of the response items.		
Round 2 Panel Review Members		
Panel Members	Organization	Area of Expertise
Ms. Cindy R. Bazzell	University of Georgia	M.Ed. Business Education / Student teacher
Ms. Elisabeth Bennett	Editorial Associate for Adult Education Quarterly, University of Georgia	Technical training and instructional design / Doctoral student in Adult Education
Ms. Lisa Byrd	University of Georgia	B.S. Family & Consumer Sciences / Student teacher
Mr. Randy Landry	Oconee County High School	Business education teacher – 12 years
Ms. Liza M. Pliska Robinson	IBM of Atlanta	IBM invoice investigator / MBA student in online program
Second Review Results		
Self-Efficacy and Learning Strategies Survey:		
Place column labels periodically throughout the survey to prevent having to scroll back up to the top. Average completion time for both surveys was 15 minutes. Time needed for both surveys to appear on screen was less than 6 seconds for both dial-up connections and Digital Subscriber Line (DSL) technology. Questions that were 2 lines long were out of line with their question number and needed reformatting. All felt these online surveys were organized, easy to complete, and colors were pleasing. Different browsers were used to test all surveys; no problems encountered when completing them. Only 1 panel member had never taken an online course; another had previously taken seven.		
Satisfaction Survey:		
"Please enter a number" in the first and second question should be a larger text size.		

Review Criteria Provided to Faculty Panel of Experts

Please provide feedback regarding the directions, instrument items, and overall instrument. Please feel free to write your comments on the instrument(s) and this form. The *consensus* procedure will be used to reach decisions regarding the final format of each instrument. E-mail will be used to communicate agreement.

I would like to have your comments no later than Tuesday, November 11. I am trying to complete the review process so that I can administer the instruments to students' before the fall semester ends. After this review, I will still have another review process completed by a panel of experts with experience in online education courses.

Please place comments and written material in my mailbox on the second floor at Rivers' Crossing, 850 College Station Road, Department of Occupational Studies.

If you have any questions I can be reached via e-mail: **nprobinson@mindspring.com**, **npr@uga.edu,** or home phone: [phone number].

Nancy Robinson
Graduate Assistant, Department of Occupational Studies

Directions:

1. Are the directions concise? If **no**, please explain.

2. Are the directions clear? If **no**, please explain.

3. Are the directions complete? If **no**, please explain.

Instrument items:

4. Are the items appropriate? If **no**, please explain.

5. Are the items clear? If **no**, please explain.

6. Are items essential? If **no**, please explain.

7. Are items useful but not essential? If **yes**, please explain.

8. Would you revise any item(s)? If **yes**, please explain.

9. Do you recommend deleting an item(s)? If **yes**, please explain.

10. Do you recommend adding an item(s)? If **yes**, please explain.

11. Other comments?

Online Self-Efficacy and Learning Strategies Survey

1. **Items 8-13**: *Prior computer experience* is used to determine student's familiarity with and level of expertise in four different computer experience categories: (1) word processing/presentation software, (2) navigating the Web, (3) using e-mail, and (4) creating Web pages.

2. **Items 14-36**: *Online Self-efficacy* measures students' self-efficacy beliefs with online Web-course tools. Students are also expected to be proficient users of a range of software applications. Self-efficacy is a student's beliefs about his/her capacities to successfully perform a given task. Self-efficacy expectations affect the extent students' will attempt existing behaviors, how much effort they will expend, and how long they will persist in the face of obstacles (Bandura, 1977). Web-course tools include electronic mails (e-mails), chat sessions, and bulletin board discussions. The subscales and related items are as follows:

- Internet performance expectations: Items 14 – 17.
- Asynchronous performance expectations:
  - Bulletin board Items 22-25
  - E-mail Items 26-29
  - Creating a Web page Items 30-33
- Synchronous performance expectations: Items 34-36

3. **Items 1-30** (2nd section): *Learning Strategies* is a modified version of the Motivated Strategies for Learning Questionnaire (MSLQ). This version has 5 Likert-type scale items, reduced from 7. The subscales and related items are as follows:

- Metacognitive self-regulatory activities – planning, goal setting, and task analysis help to activate prior knowledge: Items #1, 4, 7, 9, 14 15, 16, 17, 20, 27, 29, & 30
- Time and study environments – resource management strategies: Items #3, 8, 13, 21, 23, 24, 28, & 31
- Effort regulation – commitment to completing one's study goals: Items #5, 11, 19, & 25
- Peer learning – helps clarify course material and reach insights: Items #2, 10, & 12
- Help seeking – manage support of others: Items #6, 18, 22, 26

Online Satisfaction Survey

Purpose is to determine students' satisfaction with the results of their learning and satisfaction with the delivery process. Social factors such as degree of support, connectedness, and peer feedback are strong determinants of students' success and satisfaction in an online course. The subscales and related items are as follows:

- Teacher interaction: Items 6-17
- Classmate interaction Items 18-20
- Technical support Items 21-22

Panel of Experts

Survey Review Criteria of
Online Self-efficacy and Learning Strategies and Online Satisfaction Surveys prepared by Nancy P. Robinson

I. First, some information about yourself

1. What is your name?

2. What is your area of expertise, e.g., your major, your highest degree currently held, achievements or awards, or your employment experience?

3. What organization or institution are you currently affiliated with? What is your position, e.g., student, teacher, or job title?

4. How many online courses have you previously taken?

5. How many courses have you previously taken that have used an online interface, such as WebCT, to facilitate instruction?

II. Technology and system information

1. What operating system are you using to evaluate these surveys?

2. What browser software are you using, e.g., Netscape or Internet Explorer to evaluate these surveys?

3. Are you currently using a dial-up connection, DSL, or are you on a network?

4. How fast is your Internet connection? If you do not know, approximately how long did it take for the Web pages to appear on your screen (in minutes)?

III. Completion time

Please indicate how long it took you to complete each survey (in minutes):

1. Self-efficacy and Learning Strategies Survey:

2. Satisfaction Survey:

IV. Layout and Design

1. Is the welcome screen motivational and is the purpose of the surveys clearly stated? If **no**, please explain. (Please note that IRB–University of Georgia's review board–mandated the inclusion of specific information.)

2. Are directions clear? If **no**, please explain.

3. Is the visual appearance of each survey consistent and acceptable, e.g., are the colors and font pleasing? If **no,** please explain.

4. Are the mode implications or method of entering responses clear, e.g., selecting radio buttons? If **no,** please explain.

5. Are graphical symbols that are used in the survey completion process adequate? If **no**, please explain.

6. Are the grammar, spelling, and mechanics of the surveys correct? If **no**, please explain.

7. Are the text labels aligned properly? If **no,** please explain.

8. Is it easy to go back and correct mistakes? If **no**, please explain.

V. Survey features

1. Does the scoring feedback add to your knowledge about the topics of self-efficacy and learning strategies?

2. Is the organization of sections clear? If **no,** please explain.

3. Are the questions too long and difficult to understand? If **yes,** please explain.

4. Are the text boxes (where you have to enter text) too long or not long enough? If **yes**, please explain.

5. Are the rating scales confusing? If **yes**, please explain.

6. Are any of the questions worded in such a way that you become frustrated and do not want to complete the survey? If **yes,** please explain.

7. What suggestions do you have for improving the survey instruments?

Thank you for participating as an Expert. Please **e-mail** all responses no later than Tuesday, November 18 to:

Nancy Pliska Robinson
Graduate Assistant, Department of Occupational Studies
The University of Georgia
Home phone: [phone number]
Email: nprobinson@mindspring.com
npr@uga.edu
npr@nprzone.com
URL: http://nprzone.com

APPENDIX E

FINAL ONLINE CONSENT FORM AND SURVEY INSTRUMENTS

Dear Survey Participant:

My name is **Nancy P. Robinson** with the **Department of Occupational Studies (706) 542-1682**. I am a doctoral student under the direction of Dr. Roger B. Hill, Department of Occupational Studies (706) 542-4100 at The University of Georgia. I am currently conducting a study to examine students' learning and satisfaction with online distance education. I am trying to determine a profile of learner characteristics in an online classroom environment.

If you agree to take part in this study, over the course of the semester, you will be asked to complete two questionnaires. The first questionnaire is related to your confidence in using Web course tools and your study skills used for your online course. The second questionnaire is related to your satisfaction with your online course. In addition, your class participation will be analyzed to observe patterns and structural features of online discussions. You will receive feedback on your study skills and learning strategies that may be beneficial for improving your study skills during the semester.

Your participation is entirely voluntary and not related in any way to your grade in this class. You may decide to participate now, but you can withdraw from the study at any time during the course of the semester without penalty, and the results of your participation will be removed from the research records or destroyed.

Synchronous (instantaneous) sessions may be recorded as sound files in order to determine levels of participation in online discussions. Only the patterns of interaction and structural features of discussions, such as threaded discussions, will be documented. Any data will be coded to remove all identifiers of participants. You will have the right to review/edit the tapes. They will only be used for educational purposes and will be destroyed at the conclusion of this study.

The results of your participation will be **confidential** and will not be released in any individually identifiable form. There is a limit to the confidentiality that can be guaranteed due to the technology itself. The technology I am referring to is the Internet. No information about you, or provided by you during the research, will be shared with others without your written permission, except if necessary to protect your rights or welfare (for example, if you are injured and need emergency care); or if required by law.

Your e-mail address will only be used to eliminate duplicate entries and to inform you if you have **won the lottery**. It will take an estimated time of 15 minutes to complete both surveys. Yes! Each participant who has completed both surveys will be assigned a number and will be **eligible for a $100.00 gift certificate to Amazon.com**. There will be one entry for each participant. One number will be chosen at random at the end of April 2004, and you will receive notification by WebCT e-mail that you have the winning number!

Entering your password to the linked surveys indicates that the researcher has answered all of your questions to your satisfaction and that you consent to volunteer for this study. You can print a copy of this form for your records.

I am asking you to please volunteer a few minutes of your time to complete the linked questionnaires dealing with online satisfaction and online self-efficacy and learning strategies. I will answer any further questions about the research, now or during the course of the project, and can be reached by my home telephone at: [home phone].

Thank you for your help and cooperation.

Nancy Pliska Robinson
Department of Occupational Studies
The University of Georgia, Athens, GA
http://nprzone.com
npr@nprzone.com
npr@uga.edu

Additional questions or problems regarding your rights as a research participant should be addressed to Chris A. Joseph, Ph.D. Human Subjects Office, University of Georgia, 606A Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-mail Address IRB@uga.edu .

Your Information	
Enter Your UGA Email Address	
Enter Survey Password	
Take me to the Survey	

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Online Self-efficacy and Learning Strategies Survey

I am interested in investigating your confidence in using Web course tools (e-mail, bulletin board, and chat) and in understanding how you learn in an online distance education environment. This information will be very helpful in developing a profile of learners' characteristics in an online course. After completing the entire survey, you will receive feedback on your study habits and learning skills.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however you may skip any questions you feel uncomfortable answering.

Remember to click the **Submit** button when you have completed this section. This will take you to the **Final Section -- Learning Strategies.** It is important that you **complete both sections**.

First, some basic questions about yourself . . .

1 How many classes are you taking this semester? *Please enter a number.*

2 What is your age as of your last birthday? *Please enter a number.*

3 How many online courses have you previously taken? *Please enter a number.*

4 What is your highest degree held at time of registration for this online course(s)?

○ Bachelor's degree ○ Master's degree ○ Doctorate ○ Other

5 Do you own a computer?

○ Yes ○ No

6 Do you have access to a computer when you are **not** in school or at work?

○ Yes ○ No

7 Are you male or female?

○ Male ○ Female

Computer experience: Prior to taking this course, what was your level of experience with . . .		**(1) None**	**(2) Beginner** (Knows a few operations)	**(3) Competent** (Knows basic operations in all categories)	**(4) Expert** (Can teach others)
8	word-processing (create, edit, save, print documents)?	○	○	○	○
9	e-mail (compose, edit, send, receive)?	○	○	○	○
10	browsing and searching on the Word Wide Web	○	○	○	○

	(WWW)?					
11	accessing library resources using the WWW?	○	○	○	○	
12	presentation software (e.g., PowerPoint)?	○	○	○	○	
13	creating Web pages with Web authoring software (e.g., Dreamweaver)?	○	○	○	○	
	Online Self-efficacy (your confidence in using Web course tools): **Using the WWW, how confident do you feel . . .**	**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
14	accessing a Web browser (e.g. Netscape or Internet Explorer)?	○	○	○	○	○
15	using menus/navigational buttons?	○	○	○	○	○
16	clicking on a link to a specific Web site?	○	○	○	○	○
17	entering a URL to access a Web site?	○	○	○	○	○
18	creating a bookmark to favorite Web sites?	○	○	○	○	○
19	conducting a search on the Web by using words or phrases used in the course?	○	○	○	○	○
20	printing a Web site?	○	○	○	○	○
21	downloading (saving) Web material to a hard drive or disk?	○	○	○	○	○
	Using bulletin/discussion board features, how confident do you feel . . .	**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
22	posting a new message (creating a thread)?	○	○	○	○	○
23	reading topics in chronological order or by thread (subject)?	○	○	○	○	○
24	replying to a topic for viewing by all members of the discussion?	○	○	○	○	○
25	uploading a file to a posting or reply?	○	○	○	○	○
	Using e-mail to communicate with instructor(s) or other students, how confident do you feel . . .	**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
26	sending e-mail to a specific student?	○	○	○	○	○
27	sending e-mail to several students at one time?	○	○	○	○	○

28	replying to e-mail messages?	○	○	○	○	○
29	attaching text or image files to your e-mail?	○	○	○	○	○
Participating in a "live" (synchronous) chat session, how confident do you feel. . .		**(1) Not at all confident**	**(2) Rarely confident**	**(3) Sometimes confident**	**(4) Often confident**	**(5) Always confident**
30	reading messages from one or more students?	○	○	○	○	○
31	answering a message or providing your own message?	○	○	○	○	○
32	interacting with one other student or the instructor?	○	○	○	○	○

- Click the Submit button to go to the *Final Section* -

Submit

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Online Self-efficacy and Learning Strategies Survey

Final Section

This final section relates to how you learn in an online distance education environment. After completing this final section, you will receive feedback on your study habits and learning skills.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however, you may skip any questions you feel uncomfortable answering. Feel free to provide comments in the last section if you want.

Remember to click the **Submit** button when you have completed this section.

Learning Strategies: When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
1	During online sessions, I often miss important points because I'm thinking of other things.	1. ○	2. ○	3. ○	4. ○	5. ○
2	When studying, I often try to explain the material to a classmate or friend.	1. ○	2. ○	3. ○	4. ○	5. ○
3	I usually study in a place where I can concentrate on my course work.	1. ○	2. ○	3. ○	4. ○	5. ○
4	When reading for this course, I make up questions to help focus on the material.	1. ○	2. ○	3. ○	4. ○	5. ○
5	I often feel so lazy or bored when I study that I quit before I finish what I planned to do.	1. ○	2. ○	3. ○	4. ○	5. ○
6	Even if I have trouble learning the material in this course, I try to do the work on my own, without help from anyone.	1. ○	2. ○	3. ○	4. ○	5. ○
7	When I become confused about something I'm reading for this course, I go back and try to figure it out.	1. ○	2. ○	3. ○	4. ○	5. ○
8	I make good use of my study time for this course.	1. ○	2. ○	3. ○	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
9	If course materials are difficult to understand, I change the way I read the material.	1. ○	2. ○	3. ○	4. ○	5. ○
10	I try to work with other students from this course online or by e-mail to complete the course	1. ○	2. ○	3. ○	4. ○	5.

	assignments.					
11	I work hard to do well in this course even if I don't like what we are doing.	1. ○	2. ○	3. ○	4. ○	5. ○
12	When studying, I often set aside time to discuss course material online with a group of students from the class.	1. ○	2. ○	3. ○	4. ○	5. ○
13	I find it hard to stick to a study schedule.	1. ○	2. ○	3. ○	4. ○	5. ○
14	Before I study new course material thoroughly, I often skim it to see how it is organized.	1. ○	2. ○	3. ○	4. ○	5. ○
15	I ask myself questions to make sure I understand the material I have been studying in this class.	1. ○	2. ○	3. ○	4. ○	5. ○
16	I try to change the way I study in order to fit the course requirements and the instructor's teaching style.	1. ○	2. ○	3. ○	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
17	I often find that I have been reading for this course but don't know what it was all about.	1. ○	2. ○	3. ○	4. ○	5. ○
18	I e-mail or call the instructor to clarify concepts I don't understand well.	1. ○	2. ○	3. ○	4. ○	5. ○
19	When course work is difficult, I either give up or only study the easy parts.	1. ○	2. ○	3. ○	4. ○	5. ○
20	I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course.	1. ○	2. ○	3. ○	4. ○	5. ○
21	I have a regular place set aside for studying.	1. ○	2. ○	3. ○	4. ○	5. ○
22	When I can't understand the material in this course, I e-mail another student in this class for help.	1. ○	2. ○	3. ○	4. ○	5. ○
23	I make sure that I keep up with the weekly readings, discussions, and assignments for this course.	1. ○	2. ○	3. ○	4. ○	5. ○
24	I log on to this course to monitor new discussion postings and e-mail regularly.	1. ○	2. ○	3. ○	4. ○	5. ○

When you study for this class, how true are these statements about you?		(1) Not at all true of me	(2) Rarely true of me	(3) Sometimes true of me	(4) Often true of me	(5) Always true of me
25	Even when course materials are dull and uninteresting, I manage to keep working until I finish.	1. ○	2. ○	3. ○	4. ○	5. ○
26	I try to identify students in this class whom I can e-mail for help if necessary.	1. ○	2. ○	3. ○	4. ○	5. ○
27	When studying for this course, I try to determine which concepts I don't understand well.	1. ○	2. ○	3. ○	4. ○	5. ○
28	I often find that I don't spend very much time on this course because of other activities.	1. ○	2. ○	3. ○	4. ○	5. ○
29	When I study for this class, I set goals for myself in order to direct my activities in each study period.	1. ○	2. ○	3. ○	4. ○	5. ○
30	If I get confused during an online session or while making notes, I make sure I sort it out afterwards.	1. ○	2. ○	3. ○	4. ○	5. ○
31	I rarely find time to review my notes or readings before an exam.	1. ○	2. ○	3. ○	4. ○	5. ○
32	Additional comments about your online course experience . . .					

Submit Reset

This section (31 questions) of the Online Self-efficacy and Learning Strategies Survey is a modification of the MSLQ (Motivated Strategies for Learning Questionnaire) developed by Pintrich, Smith, Garcia, & McKeachie, 1991)

NPliksaRobinson 2003

Your Online Self-efficacy score is 4 of 5.

Your Learning Strategies score is 3.5 of 5.

Self-efficacy represents how you feel about your own abilities to accomplish a task. When applied to learning, it means the degree to which you believe you can learn something. For example, if you have high, positive self-efficacy about learning a second language, then you will have the power and ability to reach that goal. On the other hand, low self-efficacy indicates you feel you do not have the power and ability, and admit failure from the beginning. With high self-efficacy, you are more likely to succeed at learning and are more motivated to seriously study. You will work hard, persevere when things get tough, and find satisfaction in the successful accomplishment of a learning task.

Learning strategies are skills that help you learn faster and more effectively. There are lots of different learning strategies that help students succeed. For instance, time management has to do with how well you manage large projects and essays. If you find you are always procrastinating and leaving projects until the last minute, you will not perform as effectively. Making notes, outlining material, and summarizing are also effective methods for increasing your knowledge. Students who know how to study by regulating their environment, such as turning off the TV or eliminating distractions in order to concentrate more, will be more successful. Students with good learning strategies enjoy college more because they are less stressed than other students who struggle. By being a better learner, you can be more productive and increase your skills and knowledge in less time than it has taken you in the past.

All of these scales are based on a five-point scale. Although some items were worded negatively, I have reversed those questions so that in general, a higher score such as a 3, 4, or 5 is better than a lower score like a 1 or a 2. The average score for your class will be provided after all data has been tabulated.

Thank you for participating in my survey.

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Online Satisfaction Survey

I am interested investigating your satisfaction with what you feel has been accomplished in your online distance education course. This information will be very helpful in developing a profile of learners' characteristics in an online course. The items in this survey have been designed to determine your level of **satisfaction** from ***Very Unsatisfied (1)*** **to** ***Very Satisfied (4)*** with your online experience.

Your responses will have absolutely no bearing on your course grade. All information will be kept confidential. It will be helpful if you answer every item, however, you may skip any questions you feel uncomfortable answering. Feel free to provide comments in the last section if you want.

Remember to click the **Submit** button when you have completed the survey.

First some basic questions about yourself . . .

1 How many online courses have you previously taken? *Please enter a number.*

2 What is your age as of your last birthday? *Please enter a number.*

3 What is your highest degree held at time of registration for online course(s)?

○ Bachelor's degree ○ Master's degree ○ Doctorate ○ Other

4 What is your major?

○ Education ○ Other

5 Are you male or female?

○ Male ○ Female

How satisfied were you in your online course with regard to...	(1) Very Unsatisfied	(2) Unsatisfied	(3) Satisfied	(4) Very Satisfied
6 availability of course syllabus?	1. ○	2. ○	3. ○	4. ○
7 availability of assignments?	1. ○	2. ○	3. ○	4. ○
8 availability of other course content (objectives, calendar)?	1. ○	2. ○	3. ○	4. ○
9 access to instructor (via e-mail or phone)?	1. ○	2. ○	3. ○	4. ○

10	organization of assignments and course content?	1. ○	2. ○	3. ○	4. ○
11	ease-of-use (with content, navigation, etc.)?	1. ○	2. ○	3. ○	4. ○
12	submitting assignments from anywhere?	1. ○	2. ○	3. ○	4. ○
13	taking quizzes remotely (off campus)?	1. ○	2. ○	3. ○	4. ○
14	receiving feedback about questions and assignments from the instructor?	1. ○	2. ○	3. ○	4. ○
15	instructor encouraging high standards of performance?	1. ○	2. ○	3. ○	4. ○
16	your own performance in this course?	1. ○	2. ○	3. ○	4. ○
17	your overall online experience in this course?	1. ○	2. ○	3. ○	4. ○
18	amount of interaction with classmates?	1. ○	2. ○	3. ○	4. ○
19	ability to provide insightful reactions to classmate's opinions and ideas?	1. ○	2. ○	3. ○	4. ○
20	supportive comments in chat room discussions?	1. ○	2. ○	3. ○	4. ○
21	access to technical support (via e-mail or phone)?	1. ○	2. ○	3. ○	4. ○
22	access to course tool's Help files?	1. ○	2. ○	3. ○	4. ○
23	**Additional comments to explain your level of satisfaction with your online course experience . . .**				

Submit Reset


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Online Satisfaction and Learning Strategies
Survey
Thank you for participating in my survey.

APPENDIX F

SAMPLE E-MAIL SURVEY REMINDERS

Sample of first WebCT e-mail survey reminder to students enrolled in an online course:

Subject Survey Research Project
[student's first name],

The first of 2 surveys is now available at the following web site: http://nprzone.com

- You can take this survey only ONE time.

- You must enter your UGA e-mail address. This is your UGA MyId@uga.edu. Example: npr@uga.edu.

- The password for this survey is: teach.

- The password for Survey 2 will be sent via WebCT e-mail in April. Both surveys must be completed by the end of April to qualify for a chance to win a $100.00 gift certificate to Amazon.com. Participation is voluntary.

This first survey has two sections that are concerned with your learning strategies and confidence in using web tools in your online distance education course.

This study is an important one that will help instructors understand the characteristics of students enrolled in online courses and whether their expectations are being met.

Thank you for your time and consideration. It's only with the thoughtful help of people like you that my research can be successful.

Sincerely,

Nancy Pliska Robinson

Graduate Assistant, Dept. of Occupational Studies

Sample of second WebCT e-mail survey reminder to students enrolled in an online course:

Subject Survey research project

[Student's first name],

About a week ago, I sent you an e-mail about an Online Self-efficacy and Learning Strategies Survey. I am a Ph.D. student in the Department of Occupational Studies. This survey will help you understand how you learn in an online education environment. The information you provide will be very important to instructors in developing a profile of learners' characteristics in an online course. As I mentioned before, answers are confidential.

If you have not yet had time to complete the survey, please do so as soon as possible. The survey is accessible at: http://nprzone.com . You will also be eligible for a $100 gift certificate to Amazon.com if you participate.

To access the survey, you must enter the following:

- Your UGA e-mail address. You must use your UGA MyID followed by @uga.edu. Example: npr@uga.edu.

- The password for this survey is: teach.

Should you have any questions or concerns, feel free to contact me at [home phone number], or my e-mail at npr@uga.edu. Thank you for your cooperation.

Nancy P. Robinson Graduate Assistant, Dept. of Occupational Studies Rivers' Crossing, Athens, GA

Sample of third WebCT e-mail survey reminder to students enrolled in an online course:

Subject Survey research project

[Student's first name]

A couple of weeks ago, I asked you to participate in a survey about learning strategies in online distance education courses.

Could you please complete the survey today? As it is available to a small representative sample, it is most important that your responses are included in the study if I am to characterize students' learning strategies adequately.

Remember, the survey is confidential. The survey is accessible at: http://nprzone.com. Use your UGA e-mail address with your MyID followed by @uga.edu. Example: npr@uga.edu. The password for the survey is: teach.

You must complete this survey and a satisfaction survey that will be offered at the end of the semester to be eligible for a $100 gift certificate to amazon.com.

If you have any questions, please call me at [home phone]. You can also e-mail me if you do not want to receive any more reminders.

Thank you,

Nancy P. Robinson
Graduate Assistant, Department of Occupational Studies
npr@uga.edu

Sample of fourth WebCT e-mail survey reminder to students enrolled in an online course:

Subject Survey participation - $100 prize - last chance

[Student's first name],

A few days ago I sent you an e-mail inviting you to participate in an online learning strategies survey.

You must complete this survey and a satisfaction survey available at the end of the course to qualify for a chance to win a $100 gift certificate to Amazon.com.

For your entry to count, the learning strategy survey needs to be completed by March 5, 2004. The survey is located at: http://nprzone.com . To complete the survey, enter your UGA e-mail address. For example: npr@uga.edu. The password is: teach.

As mentioned previously, this survey is confidential. Your responses will help teachers do a better job of meeting student's needs in online distance education courses.

I greatly appreciate your help with this important survey.

Sincerely,

Nancy Pliska Robinson
Graduate Assistant
Department of Occupational Studies
The University of Georgia
Rivers' Crossing
Home phone: [phone number]
Email: npr@uga.edu
nprobinson@mindspring.com

Sample follow-up e-mail to collect data from nonrespondents:

Subject I need your help!
[Student's first name],

In completing a follow-up for the research project I have conducted this term, it would be most helpful if you could provide me with the following information in a reply e-mail message:

Gender:

Year graduated from high school:

Highest degree already completed:

It would also really help if you could give me a brief explanation or reason for not completing the surveys. All information is voluntary and confidential.

Thank you for your assistance, Nancy P. Robinson, Ph.D. Candidate, Dept. of Occupational Studies, Home: [phone number]