TRANSACTIONAL DISTANCE THEORY AND STUDENT SATISFACTION

WITH WEB-BASED DISTANCE LEARNING COURSES

by

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ABSTRACT

TRANSACTIONAL DISTANCE THEORY AND STUDENT SATISFACTION
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Joseph Vance Burgess

The purpose of this study was to examine the relationships between student satisfaction with fully online courses and two components of Moore's theory of transactional distance: (a) learner autonomy and (b) dialog between the instructor and student. The results described here support a change from the traditional instructor-centered approach to that of a student-centered learning environment based on interactions supporting distant student needs. Contemporary Web-based distance learning technologies now provide the opportunity to offer student-centered courses that are designed to meet the needs of the individual learner. The success of online distance education may well depend upon the ability of educational leaders to personalize the teaching and learning process to satisfy and retain distance students (Saba, 1999).

CHAPTER I

INTRODUCTION

Societal transformations have occurred throughout history. The basis for
our society has changed from agrarian to industrial and, more recently, from
industrial to the information age. Technological advancements, primarily in
computer-based applications, have made information and digital data processing
skills fundamental requirements in our current culture. Many individuals educated
before the computer age, find themselves lacking the abilities necessary to
efficiently function in the modern digital generation (Gilbert & Moore, 1998).

In an effort to adapt to the societal evolution, adults seek additional
education to improve their knowledge and skills. Many of these students are
quite different from the younger, more traditional, higher education student
(Kadlubowski, 2000). Today, a typical college student may be a single parent
working to make ends meet or a mid-life professional looking for a career
change. They desire to pursue higher, more advanced education but are unable
to meet the time and commitment constraints required by a traditional
educational institution (Kadlubowski).

These nontraditional students, searching for new skills and abilities, are
discovering new methods of acquiring the instruction they seek through the

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process of distance education. Distance education is traditionally viewed as instruction that is conducted when the student and instructor are geographically separated. Its origins can be traced to the late 1800s correspondence courses (McIsaac & Gunawardena, 1996). During the mid-1900s, radio, then television, offered new delivery systems for education at a distance. Recent interactive, computer-based technological advancements have made it possible to conveniently deliver instructional content directly to students and have begun to blur the distinction between distance and traditional education (McIsaac & Gunawardena).

Higher education institutions are responding by rapidly expanding distance education opportunities through Web-based instruction. The percentage of 2-year and 4-year higher education institutions offering distance education courses increased from 33% to 44% between the fall of 1995 and 1997 to 1998 (U.S. Department of Education, 2000). During the same time period, the number of different distance education course offerings increased from 25,730 to 52,270 (U.S. Department of Education). This growth is in part a response to the increased numbers of nontraditional students. These older students are already working and are unable to meet the traditional time requirements of institutions of higher education. Many schools now realize they must adjust their offerings to accommodate this diverse and ever-growing population of students with convenient and flexible Web-based instruction (Kadlubowski, 2000).

Educational Problem

The popularity of distance learning has grown rapidly because of the integration of interactive instructional technologies like two-way audio/video courses and Web-based instruction via the Internet (Sherry, 1996). Higher education institutions responding to a recent Sloan Consortium survey indicated that over 1.9 million students enrolled in U.S. higher education online courses in the fall of 2003 (Sloan Consortium [Sloan-C], 2004). These institutions expect online enrollment growth to accelerate by almost 25% in 2004 to 2.6 million students online in the U.S. (Sloan-C). Because the World Wide Web has become a viable and convenient means for delivering instructional content, a large number of college students, high school students, and life-long learners will be taking their classes in online distance learning environments (Kadlubowski, 2000). This migration of students to learning environments where the instructor and student are separated (physical or temporal separation) has many education professionals questioning the nature and quality of education at a distance (Munro, 1998).

Criticism of distance learning primarily revolves around the perceived passive and isolated environment of the distant learner (Hara & Kling, 2000). Students tend to seek learning conditions similar to traditional classrooms since they are familiar and comfortable with the face-to-face, instructor-centered classroom experience, which minimizes the students' responsibility for their own learning (Jaffee, 1998). Technical problems inherent in online courses (connections to ISPs, download and installation of browser plug-ins, discussion

boards, listserv subscriptions, et cetera) also tend to confuse and frustrate learners unfamiliar with the new environment. Finally, the nature of asynchronous, Web-based interactions can produce a communication gap or psychological obstruction to the learning process. These barriers can create the potential for misunderstandings between students and instructors and magnify the potential for online student isolation.

Consequently, effective communication strategies are critical elements in the successful implementation of a Web-based, distance-learning course. Interactive communications between student and instructor help ensure that problems are averted, knowledge is constructed, and students are motivated to continue online courses (Berge, 1999). Instructor-to-student communication is the critical interaction required to close the feedback loop so the student comprehends course content and recognizes successful completion of assignments (Northrup & Rasmussen, 2000). Timely responses and developing an understanding relationship with the instructor provide comfort for confused and frustrated online learners.

Educational Significance of the Study

Interaction is a principal objective of any instructional process because it is a fundamental expectation of both students and instructors (Berge, 1999). It plays a fundamental role in a student's retention and perception of course and instructor effectiveness in both traditional and distance learning classrooms (Flottemesch, 2000). Due to the physical separation, novice online students and instructors are frequently skeptical about the ability of Web-based distance

learning courses to duplicate the perceived interaction normally found in a traditional classroom-learning environment (Gilbert & Moore, 1998). Student perception of interaction, or lack thereof, offered in a Web-based course may have a substantial effect on the desired instructional outcomes depending upon each student's capability to learn on his or her own.

Current interactive technologies provide the means for distance instructors to begin to adapt course structure and set the appropriate level of interactive dialog to the specific abilities and needs of the individual student. It is therefore important that the online teaching and learning process undergo further examination from the student's viewpoint. This perspective involves a change from the traditional, instructor-centered course model to a student-centered system based on providing the necessary interactive instructional support required to engage and motivate students learning at a distance (Berge, 1999; Flottemesch, 2000; Gilbert & Moore, 1998). The success of online distance education may well depend upon the ability of educational leaders to personalize the teaching and learning process to satisfy and retain distance students (Saba, 1999).

Additionally, questions have arisen as to whether distance education has the theoretical foundation necessary to explain the instructional practices and the appropriate approach required to lead the field into the future and assume a major role in the broader field of education. Many researchers studying the difference between traditional classroom education and distance education have displayed little interest in integrating theoretical literature or frameworks into their

research questions or studies (Saba, 2000). This study is established on Moore's theory of transactional distance in hopes the results can be utilized in making appropriate decisions regarding online instruction for undergraduate higher education institutions.

Purpose and Approach

This study was designed to explore the association between student satisfaction with fully online courses and the correlation between the two components of Moore's theory of transactional distance (a) learner autonomy and (b) dialog between the instructor and student. Moore's theory of transactional distance provides a theoretical framework from which to develop a successful distance learning environment by balancing the interaction of course structure and student-instructor dialog based upon the autonomy of the individual learner (Stirling, 1997).

The Web-based Distance Education Learning Environment Survey (DELES) instrument (Walker & Fraser, 2004) was utilized in this causal-comparative design to associate the two independent variables of learner autonomy and perception of instructor-student dialog with the dependent variable of student satisfaction with Web-based learning in an attempt to discover the relationships between the variables.

Operational Definitions

Course structure. Course structure refers to the elements of course design and their flexibility or lack thereof.

Dialog. Dialog refers to the instructor-student interaction or the communication transaction between instructor and student when one provides instruction and the other reacts. It is the extent to which the student and instructor are able to respond to each other (Moore, 1993). It is a measure of eight items from the DELES instructor-interaction-and-support scale that gauge student perceptions of how he or she interacts with their instructor.

Distance education. Moore and Kearsley (1996) maintained that special instructional design and communication procedures can overcome barriers of distance in education and promote individualized instruction and improved satisfaction with distance education. They proposed a definition of distance education that places increased emphasis on the organization and design of distance education:

Distance education is planned learning that normally occurs in a different place from teaching and as a result it requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special techniques of course design, and other technology, as well as special organizational and administrative arrangements. (Moore & Kearsley, p. 2)

Learner autonomy. Learner autonomy refers to the varying capacity of the student's ability to make decisions about his or her learning and the extent to which students rather than the instructor establish the characteristics of a learning program (Moore, 1993). It is a measure of five items from the DELES student autonomy scale.

Student satisfaction. Student satisfaction was established by the Sloan Consortium as one of the five pillars of quality online education. It is a measure of eight items from the DELES satisfaction scale.

Transactional distance. Transactional distance is the pedagogical distance of understandings and perceptions produced by the geographic separation of students and instructor. It is a dynamic measure of the relationship between the instructor and student in terms of (a) the requisite course structure, (b) the dialog provided by the instructor, and (c) the autonomy required by the student (Moore & Kearsley, 1996).

Web-based or online instruction. These courses are offered by higher education institutions to be available anytime and anywhere to students capable of connecting through a computer network.

Research Questions Investigated

Web-based courses should incorporate varying interaction strategies to allow flexibility through enhanced dialog between student and instructor. Interactive communication between instructor and student reduces transactional distance and is vital to successful online learning. Sociable communications support the instructor in shifting from the role of teacher to that of a facilitator or mentor. Responsive and pleasant interactions allow the student to take more responsibility for their learning. Once online learners realize the instructor is willing to assist in their knowledge acquisition, as opposed to just delivering information and assigning a grade, it frees them from much of the anxiety

associated with the new learning environment (Collison, Elbaum, Haavind, & Tinker, 2000).

This study focused on the responses of Web-based distance students to the following research questions.

1. What is the relationship between learner autonomy and student perception of instructor-student dialog?

2. How does learner autonomy influence student satisfaction with Web-based distance learning?

3. How does student perception of instructor-student dialog influence student satisfaction with Web-based distance learning?

4. How do student perceptions of instructor-student dialog and learner autonomy influence student satisfaction with Web-based distance learning?

CHAPTER II

INTRODUCTION

The advent of the information age has amplified the requirement to process and acquire vast amounts of new information quickly. Traditional instructional delivery methods are often unable to meet this challenge for already over-committed learners. Innovative instructional models are needed to facilitate the information delivery and knowledge conversion brought on by our societal evolution. Online distance education is one example of a new approach to learning and has produced astonishing growth in both the number of students enrolling in online courses and the number of universities offering online courses and programs (Stirling, 1997).

Researchers studying the difference between traditional classroom education and distance education have exhibited little interest in integrating theoretical literature or frameworks into their research questions or studies (Saba, 2000). The traditional academic community has struggled with the recognition of distance education because it lacked a strong base in theory (Saba). The establishment of a theoretical foundation is essential to guiding researchers and educators in making the appropriate decisions to meet the needs of higher education institutions and the students they serve (Garrison, 2000).

"Theory is an organized body of concepts, generalizations and principles that can be subjected to investigation" (Gay & Airasian, 2003, p. 40). It is the means used to understand how knowledge is organized and illustrates to researchers what is not known in a field. Theory is the reduction of knowledge to the basic principles and then presented in a manner which illustrates patterns and relationships. Understanding theory makes it possible for researchers to speak the same language and guide research by helping practitioners determine where their study integrates with other studies and facilitate collaboration within the field (Moore, 1991).

This study is founded on Moore's (1991) theory of transactional distance. The theory of transactional distance is based on the principle that the distance in distance education is more than a geographic separation of instructors and students. It is a distance of perceptions and understandings that exists in every educational transaction regardless of whether the instruction is delivered at a distance. This distance has to be addressed in every educational transaction by students, instructors, and educational organizations if effective learning is to occur (Moore). The following paragraphs outline the theory and illustrate its importance and applicability.

The genesis of Moore's transactional distance theory was his earlier theory of independent learning and teaching (Moore, 1972). The principle point of this theory is the centrality of the learner to the educational process. This fundamental characteristic made distance learning different from other forms of education at the time (Moore, 1972). Wedemeyer (1981) acknowledged that

learners hold the primary responsibility for learning, but also recognized the independence of distance learners. He believed learner independence or autonomy could be supported by providing them more control over the learning process. Holmberg's (1986) theory of guided didactic conversation focused on students and their responsibility for learning, based on the assumption that real learning is primarily an individual activity. The theory emphasized the importance of the relationship between the instructor and student and cited student-instructor dialog as the critical defining aspect of distance education (Saba, 2003).

In 1993, Moore published his theory of transactional distance (Stirling, 1997). He stated that transactional distance is the psychological space or communications gap between students and instructors that must be negotiated in order to maximize learning. It is a function of three components (a) dialog, (b) learner autonomy, and (c) structure. *Dialog* refers to instructor-student interaction or the communication transaction of the instructor providing instruction and the student responding. *Learner autonomy* refers to the student's ability to self-direct his or her learning. *Structure* refers to how the instructional program is designed and reflects the program's capacity to respond to a student's individual need (Stirling).

According to Moore (1991), research not grounded in theory is wasteful and reduces the ability to resolve additional problems in different times and different places. To validate findings and improve applicability to the distance education field, Moore's theory of transactional distance is employed as the theoretical framework of this study (Bischoff, Bisconer, Kooker, & Woods, 1996;

Chen & Willits, 1998; Kanuka, Collett, & Caswell, 2002; Saba & Shearer, 1994; Stein, Wanstreet, Calvin, Overtoom, & Wheaton, 2005). The following section describes Moore's theory of independent learning and teaching, which became the basis for his three types of interaction (Moore, 1989) and the transactional distance theory (Moore, 1993).

Theory of Independent Learning and Teaching

While studying educational theory and researching learner autonomy in correspondence courses, Moore discovered no research had been conducted or theories identified for instruction where student and instructor were not collocated. Upon further research he discovered that this type of teaching and learning was not supported by existing educational theories (Moore & Kearsley, 1996). Moore then collected and analyzed over 2,000 items of literature on noncontiguous teaching methods, including (a) television instruction, (b) correspondence instruction, (c) programmed instruction, (d) computer-assisted instruction, (e) telephone instruction, and (f) tape teaching instruction (Moore, 1972). When the analysis was complete, he proposed a new distance teaching theory in 1973.

Moore's (1973) original theory described an independent learning and teaching system composed of an autonomous learner, a teacher separated by time or space, and a method of communication. Moore called the communication system *distance teaching* and defined it as the "instructional methods in which teaching behaviors are executed apart from the learning behaviors" (p. 664).

Moore (1973) determined that a student's distance from his or her instructor is not measured in miles or time. Rather, he proposed the distance teaching communication system as a function of two components (a) dialog and (b) individualization. Dialog is the extent to which students may communicate with their instructors. Individualization is the extent to which students have control over the pace at which they receive information and provide responses (Moore, 1973).

Dialog and individualization defined the distance teaching system but failed to illustrate the influence of distance on the learner. The effect of distance experienced by learners varies by their perception of the amount of distance or separation present in the learning environment. A student's ability to function autonomously or self-direct his or her own learning is a vital factor influencing distance students. Moore (1973) concluded that distance students were compelled to be more autonomous than classroom-based students and, therefore, must accept a higher degree of responsibility for their learning than classroom-based students.

Because of increased student responsibility, Moore's (1973) early theory of independent learning and teaching proposed that instructors should be prepared to respond to students. Autonomous students looked to instructors for help gathering information and evaluating their progress. They temporarily forfeited some of their autonomy and asked for help with their educational program (Moore). This concept ran contrary to the traditional instructor-centered instructional model and required the instructor to accept a secondary role as a

resource and a facilitator. The apparent role reversal made it clear that even early distance learning theorists recognized the requirement for a more student-centered design founded on individualized content and enhanced instructor-student dialog (Berge, 1999; Hannafin & Land, 1997).

Moore's (1973) early distance learning theory showed that distance required that events within instructional programs be carefully organized for teaching methods such as correspondence and programmed instruction. Course goals and objectives must be clearly stated and presented to the target population. Materials must be well developed, illustrated, and suitably paced. Distant instructors could not improvise based upon student feedback, so questions and problems had to be anticipated and correct responses prepared in advance (Moore, 1973).

Finally, successful completion of distance instruction required instructors and students to function differently from that of traditional classroom instruction (Moore, 1973). Autonomous students looked for distinct teaching methods that were responsive instead of directive and that helped them discover their own problems and solutions. Student-centered environments also required the students to take more responsibility to perform learning tasks through a variety of different techniques that established a bridge between the student and instructor. Ultimately, the theory of independent learning and teaching described a customized instructional system. The system was composed of students who had developed the skills to learn independently, and a well-designed program of

instruction designed by instructors who anticipated student requirements and effectively responded to students' needs (Moore).

Theory of Transactional Distance

Moore's independent learning and teaching theory was his first attempt to identify and define a general theory of distance education (Moore & Kearsley, 1996). During the next 20 years of research in distance education, his concepts and assumptions were refined and refocused into the current theory of transactional distance. According to this theory, distance is a pedagogical phenomena and not geographical. It is a difference in perceptions and understanding that must be overcome by all instructors and students engaged in any educational transaction (Moore & Kearsley).

The potential for distance exists in all educational relationships whether or not students are collocated with their instructor. Anytime students do not take interest in their learning or are not engaged in meaningful dialog, distance will exist in all instructional environments (Moore, 1993; Saba, 2000; Stirling, 1997). Moore's independent learning and teaching theory evolved by emphasizing that distance in education is pedagogical in nature, not geographical. He conceived the term *transactional distance* to identify the pedagogical distance of understanding and perceptions produced by the geographic separation of students and instructors (Moore & Kearsley, 1996).

The transactional distance that exists in any educational transaction is a function of three components: (a) dialog, (b) learner autonomy, and (c) structure. *Dialog* refers to the communication transaction between instructor and student

when one provides instruction and the other reacts. *Learner autonomy* refers to the varying capacities of students to make decisions about their learning. *Structure* refers to the elements of course design and their flexibility or lack thereof. Transactional distance is a dynamic measure of the relationship between the instructor and student in terms of (a) the dialog provided by the instructor, (b) the autonomy required by the student, and (c) the requisite course structure (Moore & Kearsley, 1996; Saba, 1999).

Saba (2000) provided another perspective on transactional distance when he said it is determined by the relationship between the course structure provided by educators and the dialog needed by students. Generally, novice learners require more structure than experienced students. As novice students acquire skills and expertise, their need for dialog increases, and the transactional distance between instructors and students decreases. The student-instructor communication interaction varies depending upon the student's background, knowledge of the subject, and depth of curriculum. These transactional distance concepts align favorably to the situated learning model because interaction and collaboration among students and between students and instructors are critical components to the formation of the community of practice necessary for learning to occur in an authentic context (Lave & Wegner, 1998). Additionally, transactional distance can vary constantly depending upon what students must do to learn and what instructors must accomplish to teach at each point in time. As students become more knowledgeable and self-reliant, their need for autonomy may or may not increase. Some students who naturally display a need

for structure may continue to require a more structured approach even when they have become more competent in what they are learning. Therefore, optimal transactional distance varies for each student, subject, and instructional situation. The goal should be for instructor and student to optimize transactional distance within a certain range to keep the instructional session productive (Saba, 2000).

Although never linked to Moore's work, transactional distance clearly parallels Vygotsky's (1978) theoretical framework on social interaction's fundamental role in learning and development. Vygotsky's zone of proximal development described the gap between a student's actual level and potential level of development. The actual level of development can be measured through observation, but the potential level of development is achieved only through problem solving under guidance or in collaboration with more capable peers (Vygotsky). Similar to the transactional distance relationship of dialog to autonomy, the optimal distance between the actual level and potential level coincides with the zone of proximal development, which can be measured only by observing what a student can do with help, guidance, or scaffolding from more competent others (Geert, 1994).

The application of the transactional distance theory is based on the inverse relationship between dialog and structure as related to the autonomy of each student. Transactional distance decreases when instructor-student dialog increases or when course structure decreases. Transactional distance increases when instructor-student dialog decreases or when course structure increases (Saba & Shearer, 1994). When transactional distance is high, students must

make their own decisions about what, when, and where to study. The greater the transactional distance, the more the students must bear responsibility for their learning. Therefore, students must become increasingly self-directed and possess the ability to function autonomously to be successful in distance educational systems where transactional distance is difficult to reduce (Kearsley, 2000; Moore & Kearsley, 1996).

Many distance-education systems, including correspondence courses, taped instruction, computer-based instruction, and contemporary methods of mobile learning (e.g., Personal Digital Assistant, iPOD), are inherently high in transactional distance because of their inability to provide timely student-instructor interaction (Moore & Kearsley, 1996). These courses require learner autonomy, and they must be systematically structured to ensure the student is successfully guided through the required instruction. The interactive communication characteristics of Web-based, distance learning enhance student-instructor interaction (dialog), thereby reducing transactional distance. This level of communication provides the flexibility to structure instructional programs that have a greater capability to respond to each student's level of autonomy (Kearsley, 2000; Moore & Kearsley).

Moore's theory of transactional distance provides a theoretical framework from which to develop a successful distance learning environment by balancing the interaction of course structure and student-instructor dialog based on the autonomy of the individual student (Stirling, 1997). Integrated with Gagne's nine events of instruction, course content can be specifically arranged to facilitate the

achievement of instructional outcomes for the greatest number of students (Gagne, 1985). Based upon the learners' autonomy, the extent to which an instructor is able to suitably organize course elements and supply the appropriate dialog to his or her students may determine the success of his or her distance education course (Moore & Kearsley, 1996).

This study focused on the distance student and assessed the relationships of the two components of transactional distance on which the student has a direct effect, (a) dialog and (b) learner autonomy, and how these components correlate to student satisfaction in a Web-based learning environment. The important aspects of each component of transactional distance theory and student satisfaction are reviewed in the remainder of this chapter.

<div align="center">Learner Autonomy</div>

Learner autonomy is the extent to which the student, rather than the instructor, establishes the characteristics of a learning program (Moore, 1993). Traditionally, higher-education institutions have focused on studying and supporting the teaching components of education while neglecting factors that support student learning (Chen & Willits, 1998). Previous distance-education studies based on the transactional distance theory have focused on the variables of dialog and structure, ignored the effect of learner autonomy on transactional distance (Chen & Willits). The instructor-centered approach to instruction often encourages students to become passive receivers of information dependent upon teachers for direction rather than active seekers of knowledge (Moore, 1986).

Over 30 years ago, Moore (1972) suggested that students have different capacities for decision making regarding their individual learning and that distance-education programs should take into account and support these abilities. He even went as far as to state that learner autonomy, in and of itself, should be a goal of distance education. Moore (1972) concluded by stating that the measure of success for a school is in its ability to prepare a student to be autonomous. The basis for these statements is found in the works of Carl Rogers and Jerome Bruner. Rogers (1969) stated that an educated person is one who has learned how to learn and that no knowledge is secure; only the process of seeking knowledge provides security. Bruner (1966) believed that the goal of all instruction was to create a self-sufficient problem solver. Bruner was concerned that instructor-centered learning would create a form of knowledge acquisition that was continually dependent upon the presence of the instructor. Historically, the instructor-centered teaching approach has been the dominant approach to higher-education distance instruction because of the lack of interactive media (Moore, 1993). Today, autonomous students seeking active engagement in an interactive distance-education environment require dialog and interaction to succeed.

Distance learning has traditionally been an autonomous activity that students complete on their own, essentially an exercise in independence (Holmberg, 1986). Since the learner was separate from the instructor, early distance-education programs utilized an instructor-centered approach to manage distant learning. Early distance educators were challenged to develop precise

learning objectives, instructional strategies, and evaluation methodologies that

worked equally and effectively for every student. While Moore believed the

design principles were useful, he called for distance educators to broaden their

conventional perspectives and develop partnerships between the instructors and

those students who demonstrated independence and the ability to self-direct their

learning. Although not all students are self-directing, each has the ability and

potential to take responsibility for his or her learning. Lebow (1993), made the

same argument when he called for the integration of a constructivist approach to

instructional design to promote learner autonomy and control. Therefore,

distance education programs should attempt to identify and devise ways to

encourage and support students in their pursuit of self-direction (Moore &

Kearsley, 1996).

More recently, distance education has begun the shift from the instructor-

centered instructivist to a more student-centered constructivist focus. Using the

student-centered approach, teachers become mentors and facilitators instead of

directors and lecturers (Diaz, 2000). This shift in perspective may provide

autonomous students the flexibility to choose their style and pace of learning,

thereby reducing transactional distance. Allowing students to exercise more

control over their instruction leads to increased intrinsic motivation to learn and

greater satisfaction with the learning experience (Dougherty, 1998).

The emergence of Web-based instruction, or asynchronous learning

networks, has accelerated the application of the student-centered approach in

distance education by creating a new system of interaction between teachers

and students. Additionally, network technologies have changed the relationship between the distance-learning student and the educational process by providing the student increased access to resources and additional options to control both the instructional interaction and content. Finally, the asynchronous nature of the interactions provides the student with autonomy and time to reflect and compose thoughtful responses, thereby elevating the quality and level of student interaction and participation (Dougherty, 1998).

Moore (1993) selected leaner autonomy as a cornerstone of his transactional distance theory because instructors' structuring their courses and students' taking responsibility for their learning define the distance in education. As students take more initiative and control, they influence their own response to learning, thereby reducing the distance in the educational process (Saba, 2000). Moore's concepts of learner autonomy and interaction align favorably with both the self-regulation and modeling components described within social learning theory (Bandura, 1977).

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

Traditionally, educational interaction focused on classroom-based dialog between students and instructors. Interaction is said to occur when two or more objects (e.g., students, instructors, instructional content, learning management system) participate in two or more reciprocal events that mutually influence one another (Wagner, 1994). Instructional interaction is an event that occurs between a student and his or her learning environment, the purpose of which is to change the student's behavior toward an educational goal (Wagner). Interaction is the

essential component that occurs when students take the information given and construct it into knowledge with personal relevance (Dewey, as cited in Anderson, 2003). Interaction becomes much more complex when considered in the context of the distance education environment due to the addition of a communications media. Because some form of communication is required between student and instructor, interaction remains central to the expectations of both in closing the feedback loop. Whether in distance or traditional education, interaction is a critical component of instruction (Berge, 1999).

King and Doerfert (1996) stated that interaction is important to student satisfaction and the retention of distance education students. Stimulation of interest, presentation of information, application of instruction, evaluation of progress and student support are teaching events that normally occur in a conventional, classroom-based instructional environments. Typically, the organization of these events is based on that with which the instructor or educational institution is familiar and has little to do with meeting the needs or desires of students. In order for teaching events to be successful in a distance learning environment, at least three forms of interaction must be planned and implemented. Every distance educator seeking to develop effective distance learning environments should carefully consider learner-content interaction, learner-learner interaction, and learner-instructor interaction (Moore, 1989; Moore & Kearsley, 1996).

Learner-Content Interaction

Education is the process of designed learning facilitated by an instructor or educational organization (Moore & Kearsley, 1996). According to the cognitive information-processing theory, learning can occur only when instructional content is meaningful and relevant. Effective instruction must help students develop cognitive associations between what they already know and what they are being asked to understand (Driscoll, 2000). Therefore, student-to-content interaction is an essential attribute of all educational processes because the instructional content provides the stimulus for the cognitive learning process.

A primary focus of distance educators should be the development of instructional content for students. The way in which the content is arranged determines all subsequent interactions within a course. Typically, content is organized through either an instructor-centered or student-centered approach depending upon the stated outcome of the instruction or instructor preference (Northrup, 2001).

Historically, distance teaching was more instructor-centered, with the goal to facilitate interaction with content through text-based, programmed instruction or stand-alone, self-paced computer-based training applications (Moore, 1989). Correspondence courses advanced the print-based teaching medium with the development of study guides that accompanied a textbook, providing explanations of the text and directions for its study. Until recently, no other professional teaching interaction or expertise was provided (Moore).

Today, higher-education students still spend the majority of their instructional time interacting with educational content like textbooks and library resources. However, modern technologies provide the distance education student the opportunity to interact with a wider variety of content resources like audio, video, graphics, animations, and simulations. In addition, the ability of the World Wide Web to offer access to additional content has the potential to significantly expand the number of information resources and change the nature of student-content interaction to a more student-centered approach (Anderson, 2003).

Learner-Learner Interaction

According to Berge (1999), interpersonal interaction is important to learning. When students are provided the opportunity to interact with one another around course content, they can share meaning in an effort to make sense of what they are learning. This interaction helps to solidify understanding of newly learned information. In addition, interpersonal interaction has been shown to facilitate student motivation, satisfaction, and retention (Berge).

Early distance education students did not have the opportunity to interact or collaborate with one other because contemporary telecommunication tools did not exist. Today, these tools facilitate cooperative learning and the social construction of knowledge for distance education students connected through the Internet (Anderson, 2003). A study of graduate students in a fully online program indicated that participants enjoyed collaborative interactions among students to discuss and share concepts and ideas with peers. On a scale of 1 (*Strongly*

Disagree) to 5 (*Strongly Agree*), students participating in the study (*N* = 52) indicated that forming and maintaining a community of online learners (*M* = 4.94, *SD* = 1.06) was essential to their online learning environment (Northrup, 2002).

Beyond maintaining a learning community, learner-learner interaction is desirable for pedagogical reasons, which include (a) stimulation, (b) motivation, and (c) effective group collaboration (Moore, 1989). Depending upon the learner's experience and autonomy, the ability to interact with fellow students becomes invaluable at the point of knowledge application or evaluation (Moore). Providing learners the opportunity to engage with one another can assist with concept development. In addition, this type of social interaction helps distance learning move from independent study to a dynamic, collaborative learning environment (Anderson, 2003).

Quality education entails interpersonal, learner-learner interactions. Integrating these interactions into Web-based learning courses reduces the potential of isolation of distance students by providing an opportunity for not only instructional but also social interaction (Northrup, 2001). Relationship building through social interaction can promote student motivation by building a collaborative learning community. The support from the community may encourage a distance student to further interact with the course content and improve overall learning outcomes. Improved learning outcomes have the potential to improve overall student satisfaction and retention in distance education (Liaw & Huang, 2000).

Learner-Instructor Interaction

According to Moore's (1993) transactional distance theory, *dialog* refers to the instructor-student interaction, specifically the communicative transaction of providing instruction and encouraging responses. The communication transaction is based upon Shannon and Weaver's (1964) mathematical theory of communication and is the extent to which the student and instructor are able to respond effectively to each other. The content that is studied, the philosophy of the educator, the autonomy of the learner, and the medium of communication determine it. In accordance with Moore's theory, transactional distance decreases when instructor-student dialog increases or when course structure decreases. Conversely, transactional distance increases when instructor-student dialog decreases or when course structure increases (Saba & Shearer, 1994). Many distance educators regard student-instructor dialog as a significant variable in all educational transactions and as an essential component of learning (Moore, 1989).

Student-instructor interaction differs greatly from that of the traditional classroom because of geographic separation and the instructional media used in Web-based courses. The dialog between instructor and students should reinforce student comprehension of the content or clarify meanings. In the traditional classroom, student-instructor dialog normally occurs face-to-face, either one instructor to many students or one instructor to one student. In Web-based courses, this form of interaction takes place via e-mail, chat, or discussion posting. Additionally, the role of the instructor may be different within the two

environments. In a traditional classroom, the instructor is the primary focus of content delivery; online, the instructor often becomes more of a mentor and facilitator. Despite the differences, the dialog between the student and instructor is as crucial in the Web-based classroom as it is in any learning environment (Moore & Kearsley, 1996).

The instructor's influence on students when there is student-instructor interaction is much greater than when it is absent because this discourse can enhance the basic instructional elements of a course. Interactive dialog with instructors can stimulate the student's interest in the course content and facilitate motivation and self-direction. The presentation of course information can be improved by demonstrating or modeling according to the instructor's experience with the content. Instructors can then facilitate application or practice of the new information. The instructor can follow with the organization of assessments to determine if students are making appropriate progress. Finally, instructors can provide support and encouragement to each individual student based on learner characteristics and the instructor's personality and philosophy. Without student-instructor dialog, these instructional elements become highly generalized and structured. As course structure increases, so does transactional distance. This increase requires learner autonomy to take responsibility for motivation, content interaction, application, and support (Moore, 1989).

If interactive dialog between a student and instructor is possible in Web-based courses, the student is supported by an instructor who can share his or her experience by placing new knowledge into context and thereby facilitating

content application in the way that is most effective for that individual student. In conjunction with learner-learner interaction, student-instructor interaction forms a community of practice that is especially effective in facilitating the students' application of new information (Brown, Collins, & Duguid, 1989). Whatever autonomous learners can do individually for self-motivation and interaction with content, they are weak when it comes to application. They just do not know enough about the new content to be certain that they are applying it correctly. Therefore, it is during the application of new content that feedback from an instructor is likely to be most valuable (Moore & Kearsley, 1996).

Feedback is essential to every educational system since all students must receive some response from the instructor as to whether they are acquiring knowledge or applying new skills correctly (Berge, 1999). Instructor response and feedback are more critical in distance education environments because students cannot receive visual signals confirming that their assignment has been received or signifying that they are moving in the right direction. Oftentimes, distance students will stop working on their course until they receive a response from their instructor as to whether they are proceeding correctly. Northrup and Rasmussen (2000) categorized this feedback as a separate form of distance interaction. Student-to-management feedback is necessary to close the communication loop between student and instructor regarding both social and instructional communications. Without a mutual understanding that a communication transaction is complete, many distance students have difficulty moving forward in their educational process. Kulhavy and Wager (1993) agreed

that both the timing and the amount of instructor feedback can enhance student performance.

Distance learners appreciate the interaction and dialog with their instructors because it provides them with more flexibility and less responsibility in their course of study (Moore & Kearsley, 1996). In Moore's theory of transactional distance, he stated that minimal or reduced instructor-student dialog requires increased course structure, resulting in a corresponding increase in transactional distance due to nominal interactive communications. When transactional distance is high, students must make their own decisions about what, when, and where to study. The greater the transactional distance, the more students must bear responsibility for their learning. Students must, therefore, become self-directed and possess the ability to function autonomously to be successful in distance educational systems where transactional distance is difficult to reduce (Kearsley, 2000; Moore & Kearsley, 1996).

Moore (1993) expected that as instructor-student dialog increases, course structure and transactional distance will decrease because improved interactive communication capabilities. Holmberg (1986) suggesed that student-instructor dialog is the critical defining aspect of distance education. In addition, Thurmond, Wambach, Connors, and Frey's (2002) study of online nursing students ($N =$ 117) indicated that knowing their instructor ($r = .592$) and timely feedback from the instructor ($r = .514$) were significant factors in their overall satisfaction with the online course. Additional investigation revealed that a course structure focused on student-instructor interaction was the most significant predictor of

perceived learning for 1,406 students enrolled in online courses through the State University System of New York (SUNY) Learning Network (Fredericksen, Pickett, Shea, Pelz, & Swan, 2000).

Structure

Structure refers to the instructional elements of a course's design. The elements include (a) learning objectives, (b) thematic content, (c) presentations, (d) case studies, (e) animations, (f) exercises, (g) projects, and (h) exams. Similar to dialog, course structure is influenced by (a) the philosophy of the educational institution, (b) the instructor, (c) the nature of the content, (d) type of student, and (e) the method or media of delivery. Structure also reflects the flexibility or rigidity of a course's instructional strategies, assessments, and learning outcomes to the extent to which these course elements can be responsive to individual student's needs. In some courses these elements may be tightly controlled by the instructor while in other courses students may be free to work completely independently. For example, broadcast or recorded television courses are highly structured, with every instructional element precisely predetermined. They provide no means of interactive dialog and no flexibility to meet individual students' needs, therefore, transactional distance is very high. On the other hand, Web-based courses can be structured to allow students multiple paths through the content based upon the interactive dialog with their instructor. Either way, some sort of structure exists in every educational course and ultimately reflects the course's capacity to respond to a student's individual needs (Moore & Kearsley, 1996).

A student-centered structure for learning environments has been advocated as an alternative to direct instruction and as a way to promote analysis, problem solving, and critical thinking. Interactive, Web-based connectivity and its associated resources now make applying flexible student-centered learning environments more feasible than in the past. Technology-enhanced, student-centered environments provide learners the opportunity to organize instructional content into meaningful contexts relating new knowledge to existing understandings (Hannafin & Land, 1997). These interactive environments furnish educational activities that facilitate the study of instructional information at many levels, expand comprehension, and meet the individual needs of students (Hannafin & Land).

Situated learning is the psychological framework on which student-centered learning environments are based (Hannafin & Land, 1997; Northrup & Rasmussen, 2000). A situated learning environment emphasizes that students are the ultimate constructors of their own knowledge (Herrington & Oliver, 1995); therefore, the context in which the instruction is presented and the nature of the student's experience with the content is critical to student understanding and motivation. Researchers exploring the situated learning model agree that interactive computer connectivity can provide an effective alternative to real-life situations and can be applied without forgoing the authentic context that is such an essential component of this psychological framework (Herrington & Oliver).

Authentic learning activities form the pedagogical foundation for student-centered learning environments and align with the psychological foundation of

situated learning. Additionally, authentic activities form the basis on which course content is organized and the instructional methods used to present instruction (Hannafin & Land, 1997). Instead of exercises that practice a skill, many online courses employ these authentic activities as the core of their Web-based learning environment. Interactive computer technologies, realistic scenarios, and case studies are being used to immerse Web-based students in realistic problem-solving environments. These authentic, anchored learning situations create multiple benefits for the online learners (Herrington, Oliver, & Reeves, 2003).

The technology-enhanced, student-centered approach to learning can be structured to provide authentic learning activities situated in a useful, realistic context. This approach also places greater responsibility on the students to apply these activities in context and to become more self-directed in their approach to learning (Northrup, 2001). The contextual change from instructor-centered to student-centered instruction transforms the instructor into a facilitator and necessitates timely and appropriate feedback from him or her. This interactive dialog is vital in providing the opportunity for students to reflect upon their authentic instruction in conjunction with the expert experiences of their instructor (Brown & Voltz, 2005).

Distance education reflects a change in learning context from traditional instruction as all course elements must be established well in advance of delivery; therefore, course structure must be organized carefully based on the student's perspective and the complex relationship between the course content, other students, and the instructor. The variability of the student's background

combined with the interactive student-instructor relationship require careful attention when developing the course structure since it cannot be effectively managed by the instructor at the time of instruction (Brown & Voltz, 2005).

Distance educators must provide the required course structure to ensure their students attain the required standards in learning excellence. They must also establish the necessary opportunity and means for students to engage themselves in learning to meet their individual needs. The more a course is structured, the more transactional distance will occur between instructor and student because individual student needs are minimized (Saba, 2000). Conversely, when a course is established to provide students the opportunity for creative and meaningful dialog with the distance instructor, course structure, and transactional distance are decreased to accommodate individual students' needs, leading to greater student satisfaction (Saba).

Student Satisfaction

Along with learning effectiveness, access, cost effectiveness, and faculty satisfaction, student satisfaction has been established by the Sloan Consortium (Sloan-C, 2002) as one of the five pillars of quality online education. These pillars can be utilized as a framework for educational institutions to measure and improve any online program. Online students, like all consumers, are satisfied when they receive thorough, timely, and personalized support (Sloan-C).

One of the best indicators of student satisfaction is retention rate. Retention in Web-based courses, sometimes reported as low as 50%, makes student satisfaction a key variable in determining whether an institution retains

students who enroll in subsequent Web-based courses (Northrup, 2002). Students are more likely to drop courses if (a) they think the content is irrelevant, (b) they think the course is too difficult, (c) they become frustrated with completing the course, (d) they receive no feedback on their course work or progress, or (e) they become isolated because they have little or no interaction with their instructor or other students (Moore & Kearsley, 1996).

Students consistently report that timely feedback is a critical component of a Web-based course (Berge, 1999). When students ask questions of an instructor, they expect that the instructor will respond. Lack of response by instructors can create student dissatisfaction with courses and increases the feelings of isolation that often lead to lower satisfaction and retention (Northrup, 2005). Interaction, therefore, is vitally important to student satisfaction and motivation as well as to maintaining student persistence in Web-based courses and programs (Berge, 1999).

Two studies conducted by the SUNY indicated online environments that successfully provide high levels of interaction result in successful online programs. Researchers from the SUNY Learning Network (SLN) examined factors that significantly contributed to perceived learning and student satisfaction in Web-based courses. Interaction with the instructor was the single most significant contributor to perceived learning in the studied courses. Students who reported the highest levels of interaction with the instructor also reported the highest levels of perceived learning. When asked how much they learned (Fredericksen et al., 2000), student respondents (N = 1,406) reported (a) a great

deal (*M* = 1.29, *SD* = .48); (b) sufficient (*M* = 1.66, *SD* = .62); (c) insufficient (*M* = 2.45, *SD* = .78); and (d) none (*M* = 2.19, *SD* = .83) based on a scale of 1 (*I learned more than I expected*) to 4 (*I learned nothing*).

This study also indicated that students who have inadequate access to their instructors feel they learn less and are also less satisfied with their course. It appears those courses that include ample opportunity for student-instructor interaction are preferable to those with limited or no interaction. This study also demonstrated the importance of setting communication expectations. When response time is clearly communicated and consistently applied, student disappointment, anxiety, and confusion can be reduced and satisfaction and learning increased. Interaction with classmates was also a significant factor, and students reporting high levels of interaction with classmates also reported high levels of perceived learning (Fredericksen et al., 2000).

In a follow-up study conducted by the SLN, researchers examined the interactive activities that comprise and sustain productive student-instructor and student-student interaction. The study focused specifically on these interactions by examining the student perceptions of online faculty characteristics that correlate highest with student satisfaction and reported learning. On average, 75% of 6,088 respondents agreed or strongly agreed that instructor interaction facilitated high levels of satisfaction and learning (Shea, Pickett, & Pelz, 2003).

Another study of graduate students (*N* = 659) in an online MBA program revealed that student-instructor interaction (*M* = 4.70, *SD* = 1.27) was significant and had the largest correlation to perceived satisfaction (Marks, Sibley, &

Arbaugh, 2005). Researchers indicated the instructor should be an active and participatory leader to motivate students to learn. The instructor is responsible for course organization, process management, and potential learning outcomes; therefore, instructor-initiated communications are helpful in creating positive attitudes by motivating students to learn by (a) keeping them focused, (b) engaging in encouraging discussion, (c) providing feedback, and (d) sharing personal experiences. The researchers in this study demonstrated that instructor-student interaction is the most important relationship to manage when providing satisfying Web-based courses (Marks et al.).

Interaction between online students and instructor would likely include a dialog based on course requirements, utilizing e-mail, threaded discussion, or chat (Northrup, 2002). Many question whether text-based, electronic interactions can be effective. Despite the fact that instructors neither see nor hear the students, it is possible to become very familiar with them through their words. The way students express themselves and the ways in which they organize their words provide insight into who these students are as individuals (Turgeon, Biase, & Miller, 2000). Student-instructor interactivity in online distance education can be as good as, if not better than a traditional classroom and a highly significant predictor of online course satisfaction (Marks et al., 2005).

This study was designed to ascertain the relationship between student satisfaction in Web-based learning and learner autonomy and instructor-student dialog-two components of Moore's theory of transactional distance. Current interactive technologies provide the means for distance instructors to begin the

modification of course structure and set the appropriate level of dialog to meet the specific abilities and needs of the individual learner. The success of distance education may well depend upon the ability of educational institutions to personalize the teaching and learning process to provide satisfaction and retention of students (Saba, 1999).

CHAPTER III

INTRODUCTION

This research explored the association between student satisfaction with fully online courses and the correlation between the two components of Moore's theory of transactional distance, learner autonomy and dialog between the instructor and student. Moore's theory of transactional distance provides a theoretical framework from which a successful distance learning environment can be developed by balancing the interaction of course structure and student-instructor dialog based upon the autonomy of the individual learner (Stirling, 1997).

Contemporary, Web-based distance learning technologies provide the opportunity to offer student-centered online courses that are designed to meet the needs of the individual learner. The success of Web-based distance education may well depend upon the ability of educational institutions to personalize the teaching and learning processes to satisfy and retain their online distance students (Saba, 1999).

This research focused on the responses of Web-based distance students to the following research questions:

1. What is the relationship between learner autonomy and student perception of instructor-student dialog?

2. How does learner autonomy influence student satisfaction with Web-based distance learning?

3. How does student perception of instructor-student dialog influence student satisfaction with Web-based distance learning?

4. How do student perceptions of instructor-student dialog and learner autonomy influence student satisfaction with Web-based distance learning?

The Web-based Distance Education Learning Environment Survey (DELES) instrument was utilized in this causal-comparative design to associate the two independent variables of learner autonomy and perception of instructor-student dialog with the dependent variable of student satisfaction with Web-based learning in an attempt to discover the relationships between the variables.

Subjects

The target population of this study was approximately 500 undergraduate students taking fully online courses at a public, regional comprehensive university in the southeast United States. The subjects were enrolled in 18 different online courses, taught by 14 different instructors, offered through both the College of Professional Studies and College of Arts and Sciences at The University of West Florida.

The population is a nonrandom convenience sample taken from voluntary participants who self-enrolled into one of the 18 different online courses. In contrast to previous distance education research (Bischoff et al., 1996; Chen & Willits, 1998; Gorsky & Caspi, 2005; Stein et al., 2005), it is anticipated that the

results of this study may be applicable to undergraduate Web-based instruction because of higher external validity based upon the large sample size of undergraduate students taken from a variety of different courses offered by various instructors.

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

Instrumentation

Informed consent from each participant was obtained prior to their accessing the Web-based DELES survey instrument (Appendix A). Subjects were informed that their participation was voluntary, anonymous, and would in no way affect their outcomes in the course. Participants acknowledged their voluntary participation in the study by selecting the "I Accept" button that transferred participants to the DELES Web-based survey instrument.

The design, development, and validation of the DELES was guided by consistency with learning-environments research literature, consistency with previously developed learning-environments instruments, and characteristics of relevance to distance-education learning environments. The survey was developed and validated in three stages. Stage one included the identification of the six most important learning-environment scales within social organization dimensions. The learning-environment scales identified include (a) student interaction and collaboration, (b) instructor interaction and support, (c) personal relevance, (d) authentic learning, (e) student autonomy, and (f) active learning. Stage two involved writing individual items within the scales. The items were face

validated by an international panel of experts and practitioners. Stage three concerned a pilot and a field test of items, followed by item analyses for reliability and validity. The DELES also included one nonlearning environment scale to investigate any association between the six psychosocial scales and seventh scale of student satisfaction (Walker, 2003). The student-satisfaction scale was modified from the valid and reliable Test of Science Related Attitudes (Fraser, 1981). The DELES field test resulted in 680 responses from 13 countries, primarily the United States, Australia, New Zealand, and Canada. The 56 field-tested items were reduced to 42 items in seven scales after principle component factor analysis and internal consistency reliability (Cronbach's alpha) analysis. (Walker & Fraser, 2004).

Reliability. Each scale of the DELES was assessed for internal consistency. See Appendix B for the alpha reliability for each refined DELES scale, as well as for the separate satisfaction scale, for the sample of 680 students. The internal consistency reliability (coefficient alpha) ranged from 0.75 to 0.95 for the seven DELES scales (Walker & Fraser, 2004).

Validity. Construct validity for the DELES was investigated through the use of principal component factor analysis (Appendix C). Factor analysis determined the fundamental structure of a large set of variables and provides information about whether items within a given scale are measuring that scale and no other scale. Only those items with a factor loading of at least 0.50 with their own scale, and less than 0.50 with all other scales, were kept in the instrument (Walker & Fraser, 2004).

Researcher Bias

The motivation for this study and its bias limitations are products of the interests, experience, and philosophy of this researcher. I have taken part in some form of Web-based distance learning since 1994 and have been employed by a higher-education institution since August 1997 as an online instructor, online course developer, and faculty development specialist in Web-based instruction. These experiences with online distance learning have led me to believe that effective development and implementation of Web-based instruction in higher education is not only equal to but exceeds that of many traditional classroom environments. This belief stems from a background of enhanced interaction between student and instructor in online learning environments that facilitates an individualization of instruction not possible in traditional classroom environments.

This bias toward interactive, student-centered online learning environments had the potential to influence the researcher's conclusions in a more subjective study. However, the utilization of the valid and reliable DELES instrument minimized any research bias that may have been present in the study.

Limitations of the Study

Participants. The Web-based survey instrument was administered only to undergraduate students and was the only form of data collection for this study. Additionally, no other distance-education stakeholders (instructors, designers, et cetera) were surveyed or interviewed. There was no way to triangulate survey

results with any other form of data to ensure accuracy and reliability or to generalize it to a graduate student population.

Instrumentation. The DELES survey instrument (Appendix A) contains items that measure instructor interaction and support as one of its scales. This study was based on the framework of Moore's theory of transactional distance. The associated concept in Moore's theory is that of dialog or the interaction between the instructor and the student. Utilizing survey item results that purport to measure instructor interaction and support as opposed to instructor-student dialog may have induced some error.

Generalizability. It may be difficult for the results of this study to be directly generalized to higher-education institutions offering Web-based courses because it is difficult to account for the differences caused by varying online course structures, course content, and instructors. Although structure is a component of the transactional distance theory, it was ignored in this study because it is impossible to control in a public higher-education institution.

Additionally, this research reported student perceptions of online learning and student satisfaction with their online learning experience. Student satisfaction has been shown to be a key indicator with online student motivation and retention (Berge, 1999; King & Doerfert, 1996; Liaw & Huang, 2000). However, satisfaction does not necessarily predict student performance in successfully acquiring course outcomes or objectives.

Variables

The relationships between two independent variables described in Moore's theory of transactional distance (learner autonomy and dialog between instructor and student) and their relationship to the dependent variable of student satisfaction with Web-based instruction were analyzed in this study.

Independent Variables

Learner autonomy is the first independent variable, and Moore selected it as a cornerstone of his transactional distance theory because teachers structuring their courses and students taking responsibility for their learning define the distance in education (Saba, 2000). Learner autonomy is the extent to which the learner rather than the teacher establishes the characteristics of a learning program. Allowing students to exercise more control over their instruction leads to increased intrinsic motivation to learn and greater satisfaction with the learning experience (Dougherty, 1998). Learner autonomy was measured for each respondent by taking the mean of the five items from the DELES student autonomy scale that measured students' perceptions of the way in which they learn.

Whether labeled as dialog, student-instructor interaction, or instructor support, the communication process between student and instructor is a key component of transactional distance and the second independent variable of this study. Feedback is essential to every educational system since all learners must receive some response from the instructor as to whether they are acquiring

knowledge or applying new skills correctly (Berge, 1999). Oftentimes, distance students will stop working on their course until they receive a response from their instructor. Without a mutual understanding that a communication transaction is complete, distance students have difficulty moving forward in their educational process. King and Doerfert (1996) stated that this interaction is a key to learner satisfaction and retention of distance education students. Student-instructor dialog was measured for each respondent by taking the mean of the eight items from the DELES instructor-and-interaction-support scale that measured students' perceptions of how they interact with their instructor.

Dependent Variable

Student satisfaction is the dependent variable of this study and has been established by the Sloan Consortium as one of the five pillars of quality online education (Sloan-C, 2002). The success of distance education may well depend upon the ability of educational institutions to personalize the teaching and learning process to satisfy and retain distance students (Saba, 1999). Student satisfaction will be measured for each respondent by taking the mean of the eight items from the DELES satisfaction scale that seek to measure student perceptions of their enjoyment and satisfaction with their online course.

Procedures

Permission to Conduct the Study

This project was reviewed and approved by The University of West

Florida's (UWF) Institutional Review Board for Human Subjects (Appendix D).

Research Study

The Academic Technology Center at UWF is responsible for collecting

and analyzing data from online students on their attitudes and perceptions of the

quality and effectiveness of Web-based courses at the University. At the end of

the fall semester in 2005, the Academic Technology Center made the DELES

Web-based survey instrument available to 518 undergraduate students enrolled

in 18 fully online courses offered by the College of Arts and Sciences and the

College of Professional Studies at UWF. A causal-comparative study examined

the DELES survey data that were collected over a continuous 3-week time period

by INSIGHT, the South Central Instrument Library and Data Repository, an

evaluation resource that serves K-16 educational constituents by offering an

instrument library and data repository.

Design and Data Analysis Association Correlation

Research Design

The exploration of learner autonomy and dialog between the instructor

and student on the perceived satisfaction of undergraduate students with their

fully online courses was the focus of this research. A causal-comparative

research design was utilized for this study. This design is also known as *ex post*

facto research since variables are analyzed for possible relationships and effects

after the fact. Causal-comparative research normally focuses on the comparison

of different groups to a dependent variable and the relationships between

variables as they occur in a natural setting as opposed to that of an experimental

setting (Wiersma, 2000).

A causal-comparative research design was appropriate for this study

because the criteria for experimental research (random subject selection,

experimental setting, and variable manipulation) could not be met (Wiersma,

2000). Collecting data from online student participants precluded any control over

subject selection or setting because students self-select into a course that is

independently developed and implemented by various instructors. Additionally,

the independent variables of student autonomy and instructor-to-student dialog

had already occurred during the flow of the course and could not be manipulated.

Finally, participants' responses on their level of stated autonomy and perception

of dialog were compared with their satisfaction with Web-based courses.

Data Analysis

Results of the DELES instrument scales of (a) student autonomy, (b)

instructor interaction and support, and (c) student satisfaction were analyzed for

each participant. DELES item values for instructor interaction and student

autonomy were set at (a) *never* = 1, (b) *seldom* = 2, (c) *sometimes* = 3, (d) *often*

= 4, and (e) *always* = 5. Item values for the student-satisfaction scale were set at

(a) *strongly disagree* = 1, (b) *disagree* = 2, (c) *neither disagree nor agree* = 3, (d) *agree* = 4, and (e) *strongly agree* = 5. If less than half of the item values for a scale were omitted, the missing values were replaced with the item mean. If more than half of the item values for a scale were missing, the participant was deleted from that scale. DELES item score values were treated as interval data throughout this research to ensure consistency in their parametric analysis. This was appropriate for this research because only general inferences were made about the relationships between the variables (Knapp, 1990).

A measure of central tendency for each respondent was taken from the values of the five-item student-autonomy scale, the eight-item instructor-interaction-and-support scale, and the eight-item student-satisfaction scale. For each respondent, the sums of the items in all three DELES scales were averaged to produce the mean for each scale. The measure of central tendency utilized in this study was the mean, which is the most common measure of central tendency (Cozby, 1993).

To ascertain the relationship of the two independent variables, a correlation analysis was performed on the means of the student-autonomy scale and the instructor-interaction-and-support scale. A correlation analysis was appropriate since it describes the linear relationship between the two independent variables (Gay & Airasian, 2003). Correlation and regression analyses were performed on the means of the student-autonomy scale and the student-satisfaction scale to determine whether a positive correlation exists with student-satisfaction and whether student satisfaction with online instruction can

be predicted from student autonomy scores. Correlation and regression analyses were also performed on the mean of the instructor-interaction-and-support scale and the student-satisfaction scale to determine whether a positive correlation exists with student satisfaction and whether student satisfaction with online instruction can be predicted from instructor interaction and support scores. Correlation and regression analyses were appropriate because they provide values that if all are positive, could suggest that higher scores on the instructor-interaction-and-support and student-autonomy scales could be associated with greater student satisfaction with online learning (Gay & Airasian). In conclusion, a multiple linear regression was conducted on the means of both the student-autonomy scale and the instructor-interaction-and-support scale to determine whether the combination of these independent variables can more accurately predict student satisfaction with online courses. The analyses were conducted utilizing the Statistical Package for the Social Sciences (SPSS), version 13. The level of significance for the analysis was set at .05.

Multiple statistical assumptions are required for both the regression and correlation models. The relationship between the dependent variable and each independent variable is assumed to be linear in this study. The variance of the distribution of the dependent variable is constant for all values of the independent variable. The distribution of the dependent variable is normal. Finally, all observations are independent or any error associated with one value has no effect on errors associated with other values (Cozby, 1993).

During the field test validating the DELES instrument (N = 680), Walker (2003) conducted a similar study on student satisfaction and its relationship to all six psychosocial scales of the instrument. Correlation results ranged from 0.12 to 0.31 (0.25 for instructor interaction and support and 0.24 for student autonomy) and were all positive and statistically significant at the .01 level. Simple linear regression analyses were also conducted. Analyses revealed the results were all positively significantly related to student satisfaction (0.12 for instructor interaction and support and 0.11 for student autonomy). All significant correlation and regression values were positive, suggesting that higher scores on the DELES scales of instructor interaction and support and student autonomy are associated with greater student satisfaction with online learning (Walker).

Hypotheses and Data Analysis

Research Question 1. What is the relationship between learner autonomy and student perception of instructor-student dialog?

Hypothesis 1. Based upon Moore's theory of transactional distance, autonomous learners should require less instructor-student dialog.

Data Analysis 1. A correlation analysis was performed on the mean of the five-item, student-autonomy scale with the mean of the eight-item, instructor-interaction-and-support scale to support or contradict Moore's theory stated in Hypothesis 1.

Research Question 2. How does learner autonomy influence student satisfaction with Web-based distance learning?

Hypothesis 2. A positive correlation exists between the reported level of student autonomy and reported level of student satisfaction. Furthermore, student satisfaction with online instruction can be predicted based upon their scores from the DELES student-autonomy scale.

Data Analysis 2. Similar to Walker (2003), correlation and regression analyses were performed utilizing the means of the five-item student-autonomy scale and the eight-item student-satisfaction scale to determine if student satisfaction can be predicted from the mean of the student-autonomy scale.

Research Question 3. How does student perception of instructor-student dialog influence student satisfaction with Web-based distance learning?

Hypothesis 3. A positive correlation exists between the reported level of instructor interaction and support and reported level of student satisfaction. Furthermore, student satisfaction with online instruction can be predicted based upon their scores from the DELES instructor-interaction-and-support scale.

Data Analysis 3. Similar to Walker (2003), correlation and regression analyses were performed utilizing the means of the eight-item, instructor-interaction-and-support scale and the eight-item, student-satisfaction scale to determine if student satisfaction can be predicted from the mean of the instructor-interaction-and-support scale.

Research Question 4. How do student perceptions of instructor-student dialog and learner autonomy influence student satisfaction with Web-based distance learning?

Hypothesis 4. Moore's theory of transactional distance indicated that regardless of their preference for autonomy, students will be satisfied with the online course if they perceive they have received appropriate instructor-student dialog and support.

Data Analysis 4. Similar to Walker (2003), a multiple-linear-regression analysis was performed utilizing the means of both the five-item, student-autonomy scale and the eight-item instructor-interaction-and-support scale with the mean of the eight-item, student-satisfaction scale to determine if student satisfaction can be predicted from the combination of the means of the student-autonomy and instructor-interaction-and-support scales.

CHAPTER IV

RESULTS

Introduction

The results from this study that explored the association between student satisfaction with fully online courses and two components of Moore's theory of transactional distance, learner autonomy and dialog between the instructor and student, are described in this chapter. Descriptive statistics and correlation and regression analyses were employed to determine potential relationships between these variables. The remainder of this chapter includes the results from the statistical analyses of the two independent variables of learner autonomy and dialog between the instructor and student and their influence on the dependent variable of student satisfaction.

Subjects

Assignment of Condition

A total of 254 respondents accepted the consent form and attempted the Web-based Distance Education Learning Environment Survey (DELES) instrument. Seventeen respondents were eliminated from the study because they failed to complete at least half of the survey items in the three variable scales

being studied. The final sample of this study was 237 (N = 237) or 45.75% of the

518 undergraduate students enrolled in the 18 fully online courses that had

access to the DELES survey instrument during the Fall 2005 semester at The

University of West Florida. The response rate for this online survey was

considered to be good, since the average response rate is approximately 30% for

Web-based surveys (University of Texas, 2006).

Assignment of Demographic Variables

On the DELES survey instrument, participants indicated three different

demographic categories: (a) gender, (b) age, and (c) number of fully online

courses completed. Thirty-seven of the 237 (15.6%) participants who completed

the three variable scales of the survey chose not to provide responses to the

three demographic questions. The remaining 200 respondents were largely

female (4:1). Half of the respondents were more traditional undergraduate

students aged 25 and under. The other 50% of respondents were aged 26 and

above, with half of this group (25% overall) being over 40 years or older. Finally,

almost three-fourths of the students responding to the demographic questions on

this survey had completed three or more fully online courses.

Data Analysis

The Web-based DELES instrument was utilized in this causal-comparative

design to investigate two independent variables, learner autonomy and

perception of instructor interaction and support, with the dependent variable of

student satisfaction with Web-based learning in an attempt to discover

relationships between the dependent and independent variables (Appendix E).

Frequency distributions, percentage of respondents, mean distribution, standard

deviation, regression, and correlation were used to analyze the data.

A measure of central tendency (mean) and standard deviation for each

respondent (N = 237) were taken from the values of all items contained in the

three variable scales (learner autonomy, interaction and support, and student

satisfaction). Values of the five-item DELES learner-autonomy scale were

averaged to produce an overall learner-autonomy mean (M = 4.55) and standard

deviation (SD = .54, N = 237). A scale mean of 4.55 (4.0 = *often,* and 5.0 =

always) clearly demonstrates that respondents in this study believed their online

courses provided the ability to work autonomously by providing them control over

their learning environment and allowing them to make their own decisions about

how they learned. The learner autonomy mean was the highest of the three

variable scale means.

A measure of central tendency (mean) for each respondent was also

taken from the eight-item DELES instructor-interaction-and-support scale. The

237 separate means were averaged to produce an overall instructor-interaction-

and-support scale mean (M = 4.20) and standard deviation (SD = .97). A scale

mean of 4.20 (4.0 = *often,* and 5.0 = *always*) reveals that respondents in this

study indicated their online instructors provided sufficient interaction and support

and were available to help, encourage, and provide timely feedback.

Values taken from the eight-item DELES student-satisfaction scale were

averaged to produce an overall student-satisfaction mean (M = 3.81) and

standard deviation (*SD* = 1.04, *N* = 237). A scale mean of 3.81 (3.0 = *neither agree nor disagree,* and 4.0 = *agree*) indicated that respondents generally agreed that they were satisfied with their online course and thought it was enjoyable and worth their time.

As stated in chapter 3, all analyses are based on statistical assumptions. Deviations from these assumptions, if any, have little or no effect on substantive conclusions in most instances (Cohen, 1969). Because only general inferences are made about the relationships between the variables in this study, any deviations are inconsequential (Knapp, 1990).

<div align="center">Data Analysis by Research Question</div>

Research Question 1

What is the relationship between learner autonomy and student perception of instructor-student dialog?

Students who reported themselves as autonomous still indicated the need for interactive feedback and support from their instructor (See Table 1). This relationship is reinforced by a positive Pearson product-moment correlation coefficient (*r*) that is statistically significant at the .05 level. Therefore, as the mean of learner autonomy increases or decreases, the interaction and support mean also increases or decreases; and when the interaction and support mean increases or decreases, the learner autonomy mean follows.

Table 1

Means, Standard Deviations, and Pearson Correlation Coefficient for Learner Autonomy and Interaction and Support Variables from Survey Responses (N = 237)

Variable	*M*	*SD*	*r*
Learner autonomy	4.55	.54	.26*
Interaction and support	4.20	.97	

Note. Minimum and maximum scores: 1 = *Never*, 5 = *Always*.
*p < .05.

Research Question 2

How does learner autonomy influence student satisfaction with Web-based distance learning?

Students who reported themselves as autonomous were satisfied with their online courses (See Table 2). Regression analysis produced a positive coefficient (β) that was statistically significant at the .05 level. Correlation analysis also produced a positive Pearson product-moment correlation coefficient that was statistically significant. Therefore, students reporting higher autonomy scores were more satisfied with their online courses and students reporting lower autonomy scores were less satisfied with their courses.

Research Question 3

How does student perception of instructor-student dialog influence student satisfaction with Web-based distance learning?

Students who reported they received acceptable amounts of instructor-student dialog were satisfied with their online courses (See Table 3). Regression

Table 2

Means, Standard Deviations, Regression, and Pearson Correlation Coefficients for Learner Autonomy and Student Satisfaction Variables from Survey Responses (N = 237)

Variable	*M*	*SD*	β	*r*
Learner autonomy	4.55	0.54	.78*	.41*
Student satisfaction	3.81	1.04		

Note. Minimum and maximum scores for Learner Autonomy: 1 = *Never*, 5 = *Always*. Minimum and maximum scores for Student Satisfaction: 1 = *Strongly Disagree*, 5 = *Strongly Agree*.
*$p < .05$.

Table 3

Means, Standard Deviations, Regression, and Pearson Correlation Coefficients for Interaction and Support and Student Satisfaction Variables from Survey Responses (N = 237)

Variable	*M*	*SD*	β	*r*
Interaction and support	4.20	0.97	.34*	.32*
Student satisfaction	3.81	1.04		

Note. Minimum and maximum scores for Interaction and Support: 1 = *Never*, 5 = *Always*. Minimum and maximum scores for Student Satisfaction: 1 = *Strongly Disagree*, 5 = *Strongly Agree*.
*$p < .05$.

analysis produced a positive coefficient that was statistically significant at the .05 level. Correlation analysis also produced a positive Pearson product-moment correlation coefficient that was statistically significant. Therefore, students reporting higher instructor interaction and support scores were more satisfied with their online courses, and students reporting lower interaction and support scores were less satisfied with their courses.

Research Question 4

How do student perceptions of instructor-student dialog and learner autonomy influence student satisfaction with Web-based distance learning?

Students who reported themselves as autonomous and those who reported they received acceptable amounts of instructor-student dialog were satisfied with their online courses (See Table 4). Multiple linear regression analysis produced positive coefficients for both independent variables that were statistically significant at the .05 level**.** Additionally, a positive coefficient of multiple correlation (R) indicates a multivariate relationship between student satisfaction and both learner autonomy and instructor interaction and support. Multicollinearity was not a factor in this multiple regressions analysis. Although the two independent variables are linearly related, the lower Pearson correlation coefficients indicate they are not so interrelated that their individual effects can not be separated. These results suggest that students reporting higher learner autonomy and interaction and support scores will be more satisfied with their online courses than students reporting only high learner autonomy scores or interaction and support scores separately.

Summary

A causal-comparative research study was conducted using data collected from 237 undergraduate students taking fully online courses at The University of West Florida during the Fall of 2005. Four research questions focused on the association between student satisfaction with fully online courses

Table 4

Means, Standard Deviations, Multiple Linear Regression Coefficients and Multiple Correlation Coefficient for Learner Autonomy, Interaction and Support and Student Satisfaction Variables from Survey Responses (N = 237)

Variable	*M*	*SD*	β	*R*
Learner autonomy	4.55	0.54	.35*	
Interaction and support	4.20	0.97	.23*	.47
Student satisfaction	3.81	1.04		

Note. Minimum and maximum scores for Learner Autonomy and Interaction and Support: 1 = *Never,* 5 = *Always*. Minimum and maximum scores for Student Satisfaction: 1 = *Strongly Disagree*, 5 = *Strongly Agree.*
*$p < .05$.

and two components of Moore's theory of transactional distance (a) learner autonomy and (b) dialog between the instructor and student.

Descriptive statistics along with regression and correlation were used to analyze the data. This study indicated that statistically significant relationships exist between students' satisfaction with Web-based instruction and their perception of their ability to learn on their own and the interaction they have with their online instructor. Chapter 5 presents the discussion and conclusions related to the four research questions and suggestions for further research studies.

CHAPTER V

DISCUSSION

The purpose of this study was to examine the relationships between student satisfaction with fully online courses and the correlation between two components of Moore's theory of transactional distance (a) learner autonomy and (b) dialog between the instructor and student. A secondary purpose of the study was to determine if potential exists to predict student satisfaction with fully online courses based on students' stated levels of learner autonomy and instructor-to-student dialog or interaction. This chapter includes a brief review of the theoretical framework of the study and a discussion of the results of the Web-based Distance Education Learning Environment Survey (DELES) instrument as they relate to the study's four research questions. Additional discussions on the limitations of the study, implications for educational practice, and suggestions for future research are also included in this chapter.

Explanation of Findings

According to Moore (1991), research not grounded in theory is wasteful and reduces the capability to resolve additional problems in different times and different places. This study was founded on Moore's theory of transactional distance. Transactional distance is a dynamic measure of the relationship

between the instructor and student in terms of (a) the autonomy required by the learner, (b) the dialog provided by the instructor, and (c) the requisite course structure (Moore & Kearsley, 1996; Saba, 1999). The employment of Moore's transactional distance theory as the theoretical framework for this study should validate the following findings and improve their applicability to the distance education field (Bischoff et al., 1996; Chen & Willits, 1998; Kanuka et al., 2002; Saba & Shearer, 1994; Stein et al., 2005).

Analysis of the results of the DELES completed by 237 undergraduate students enrolled in fully online courses indicated that most believed they had control over their learning environment and could make their own decisions about how they learned (autonomy). The respondents also indicated their online instructor provided adequate interaction and support and timely feedback (dialog). However, there was less agreement by student respondents on their overall satisfaction with their fully online course.

Research Question 1

What is the relationship between learner autonomy and student perception of instructor-student dialog?

Hypothesis 1

Based upon Moore's theory of transactional distance, autonomous learners should require less instructor-student dialog.

In accordance with Moore's theory, decreased dialog increases transactional distance. However, autonomous students possess the ability to

function on their own and to take responsibility for their learning (Kearsley, 2000).

Respondents in this study overwhelming believed their online courses provided

the ability to work autonomously by allowing them to make their own decisions

about how they learned. The learner autonomy mean was the highest of the

three variable scales (*M* = 4.55). The high autonomy mean may be attributed to

the emergence of Web-based instruction, which has accelerated the application

of a more student-centered approach in distance education by creating a new

system of interaction between teachers and students (Dougherty, 1998;

Sampson, 2003).

While asserting autonomy, the same respondents still found benefit in

their ability to interact with the instructor as demonstrated by a high interaction-

scale mean (*M* = 4.20) and a positive Pearson product-moment correlation

coefficient (*r* = .26) that was statistically significant at the .05 level. The high

autonomy and interaction-and-support means indicate respondents believed their

online courses provided a reasonable mix of autonomy and interaction and were

structured to allow them to work at a time and pace of their choosing with timely

answers to their questions and feedback on their assignments. Contrary to the

transactional distance theory, this study indicates autonomous students require

substantial dialog with their instructor to be satisfied. In contemporary network-

based, student-centered instruction, autonomous students seeking active

engagement require dialog and interaction to succeed (Moore, 1993). Based

upon these results, Hypothesis 1 is rejected.

Research Question 2

How does learner autonomy influence student satisfaction with Web-based distance learning?

Hypothesis 2

A positive correlation exists between the reported level of learner autonomy and reported level of student satisfaction. Furthermore, student satisfaction with online instruction can be predicted based upon their scores from the DELES learner autonomy scale.

Learner autonomy is the extent to which the student, rather than the instructor, establishes the characteristics of a learning program. Historically, the instructor-centered teaching approach has been dominant in higher education distance learning because of the lack of interactive media (Moore, 1993). Contemporary Web-based instruction now provides the interaction necessary for distance education to shift to a more student-centered focus (Diaz, 2000). This shift in perspective should provide autonomous students the flexibility to choose their style and pace of learning, thereby reducing transactional distance. Allowing students to exercise more control over their instruction leads to increased intrinsic motivation to learn and greater satisfaction with the learning experience (Dougherty, 1998; Sampson, 2003).

Respondents in this study confirmed Dougherty (1998) and Sampson's (2003) assertions. Correlation analysis between learner-autonomy and student-satisfaction scales produced a positive Pearson product-moment correlation

coefficient (r = .41) that was statistically significant at the .05 level. Regression analysis produced a positive coefficient (β = .78) that was also statistically significant. Based upon these results, Hypothesis 2 is accepted.

The regression and correlation coefficients in this study confirm Walker's (2003) validation study of the DELES instrument. In his study (N = 680), the correlation analysis between the learner autonomy and student satisfaction scales produced a positive Pearson product-moment correlation coefficient (r = .24) that was statistically significant at the .01 level. Walker's regression analysis produced a positive standardized coefficient (β = .11) that was also statistically significant. In both studies all significant correlation and regression values were positive, suggesting that higher scores on the DELES scale of learner autonomy are associated with greater student satisfaction with online learning.

Research Question 3

How does student perception of instructor-student dialog influence student satisfaction with Web-based distance learning?

Hypothesis 3

A positive correlation exists between the reported level of instructor interaction and support and reported level of student satisfaction. Furthermore, students' satisfaction with online instruction can be predicted based upon their scores from the DELES instructor-interaction-and-support scale.

Instructional interaction is an event that occurs between a student and his or her learning environment to facilitate a change in the student's behavior

toward an educational goal (Wagner, 1994). Because some form of communication is required between student and instructor, interactive dialog remains central to the expectations of both in closing the feedback loop (Berge, 1999). According to the theory of transactional distance, dialog refers to this instructor-student interaction, specifically the communicative transaction of providing instruction and encouraging responses (Moore, 1993).

Respondents in this study indicated their online instructors provided sufficient interaction and support and were available to help, encourage, and provide timely feedback. Correlation analysis between the instructor-interaction-and-support and student-satisfaction scales produced a positive Pearson product-moment correlation coefficient (r = .32) that was statistically significant at the .05 level. Regression analysis produced a positive coefficient (β = .34) that was also statistically significant. Based upon these results, Hypothesis 3 is accepted.

Again, this study's correlation and regression values for interaction and student satisfaction confirm Walker's (2003) DELES validation study. In that study (N = 680), the correlation analysis between the instructor-interaction-and-support and student-satisfaction scales produced a positive Pearson product-moment correlation coefficient (r = .23) that was statistically significant at the .01 level. Walker's regression analysis produced a positive standardized coefficient (β = .14) that was also statistically significant. In both studies all significant correlation and regression values were positive, suggesting that higher scores on

the DELES scale of instructor interaction and support are associated with greater student satisfaction with online learning.

Research Question 4

How do student perceptions of instructor-student dialog and learner autonomy influence student satisfaction with Web-based distance learning?

Hypothesis 4

Moore, in his theory of transactional distance, predicted that regardless of their preference for autonomy, students will be satisfied with the online course if they perceive they have received appropriate instructor-student dialog and support.

Distance learning has traditionally been an autonomous activity that students complete on their own, essentially an exercise in independence (Holmberg, 1986). Because the learner was separate from the instructor, early distance education programs utilized an instructor-centered approach to provide the required course structure to ensure their students attained the required standards in learning excellence. The more a course is structured, the more transactional distance will occur between instructor and student because individual student needs are minimized (Saba, 2000). Conversely, when a course is established to provide students the opportunity for creative and meaningful dialog with the distance instructor, course structure and transactional distance are decreased to accommodate individual students' needs, leading to greater student satisfaction (Saba).

Students consistently report that timely feedback is a critical component of a Web-based course. Instructor interaction, therefore, is vitally important to student satisfaction and motivation as well as to maintaining student persistence in Web-based courses and programs (Berge, 1999). Respondents in this study reported they were very autonomous but also indicated their online instructors provided adequate interaction and support.

A significant regression equation exists for both independent variables. While holding the other variable constant, regression analysis produced positive standardized coefficients for both learner autonomy ($\beta = .35$) and interaction and support ($\beta = .23$) that were independent and statistically significant well below the .05 level. The coefficient of multiple correlation ($R = .47$) between student satisfaction and both autonomy and interaction is statistically significant. The coefficient of multiple determination ($R^2 = .21$) explained the proportion of variance. Learner autonomy (14%) accounted for twice the variance of interaction and support (7%). Based upon these results, Hypothesis 4 is accepted. Therefore, students reporting higher learner-autonomy and interaction-and-support scores will be more satisfied with their online courses than students reporting only high learner-autonomy scores or interaction-and-support scores separately.

Once again, this study verifies Walker's (2003) DELES validation study. As in his study ($N = 680$), the standardized regression coefficients for learner autonomy and interaction and support are independently and positively significantly related to student satisfaction. All significant correlation and

regression values were positive, suggesting that higher scores on either the DELES scale of learner autonomy or instructor interaction and support are associated with greater student satisfaction with online learning.

Limitations of the Study

This study was limited by design to a nonrandom convenience population of undergraduate students enrolled in 18 different online courses at The University of West Florida. No graduate students or additional distance education stakeholders were surveyed or interviewed in this study. Therefore, comparisons of survey results to other data to ensure reliability or to generalize it to a graduate student population were not possible.

Students' perceptions of online learning and students' satisfaction with their online learning experience are described in this study. Student satisfaction has been shown to be a key indicator with online student motivation and retention. However, student satisfaction does not necessarily predict student performance in successfully acquiring desired course outcomes or objectives. Finally, over half of the respondents in this study reported they had completed three or more online courses. Those students who might demonstrate less attraction to online courses may have chosen not to complete the survey, leaving the actual respondents with more favorable opinions on Web-based instruction.

Conclusions

Distance learning courses and programs, particularly Web-based offerings, have entered the mainstream of higher education. Nationally, online

enrollment reached 2.35 million during 2004, an 18.2% growth rate over 2003. Additionally, 64% of southern higher-education institutions identified online education as a critical long-term strategy (Sloan-C, 2006). Current interactive technologies now provide the means for distance administrators and instructors to begin to adapt course structure and set the appropriate level of interactive dialog to the specific abilities and needs of the individual student. It is therefore important that the online teaching and learning process undergo further examination from the student's viewpoint. This perspective involves a change from the traditional instructor-centered course model to a student-centered system based on providing the necessary interactive instructional support required to engage and motivate students learning at a distance (Berge, 1999; Flottemesch, 2000; Gilbert & Moore, 1998).

Based upon the positive and significant statistical analyses, respondents in this study were generally satisfied with their online courses and believed they provided a reasonable mix of autonomy and interaction. Clearly, the majority of courses surveyed were structured upon a more student-centered model that allowed respondents to work on their own and still receive timely feedback and answers to their questions. This study supports the change from the traditional instructor-centered approach to that of interactive dialog based upon distant students' needs.

Implication for Education Practice

Current literature and Moore's theory of transactional distance provided the foundation and theoretical framework of this study. The conclusions and

findings based upon this framework call for integration of a student-centered approach into contemporary distance instruction to be of significant value. The quantitative findings previously discussed are used to make the following recommendations. These recommendations focus on student-centered learning environments, facilitation of online instruction, and student satisfaction.

Recommendations

Student-centered learning environment. The instructor-centered approach to instruction often encourages students to become passive receivers of information, dependent upon teachers for direction, rather than active seekers of knowledge (Moore, 1986). The technology-enhanced, student-centered approach to learning can be structured to provide engaging learning activities situated in a realistic context. This approach places greater responsibility on the student to apply these activities in context and to become more self-directed in their approach to learning (Northrup, 2001). Carl Rogers (1969) stated that an educated person is one who has learned how to learn and that no knowledge is secure; only the process of seeking knowledge provides security. Therefore, every consideration should be given to employing the student-centered model to online learning.

Course structure for student-centered environments. Distance education reflects a change in learning context from traditional instruction since all course elements must be established well in advance of delivery. Therefore, course structure must be organized carefully based on the student's perspective and the complex relationship between the course content, other students, and the

instructor. The variability of the student's background combined with the interactive student-instructor relationship require careful attention when developing the course structure because it cannot be effectively managed by the instructor at the time of instruction (Brown & Voltz, 2005). During online course development, careful consideration should be given to the amount of structure, remembering that highly structured courses increase transactional distance between instructor and student (Saba, 2000).

Instructor to facilitator. The contextual change from instructor-centered to student-centered instruction transforms the instructor into a facilitator and necessitates timely and appropriate feedback from him or her. This interactive dialog is vital in providing the opportunity for students to reflect upon their instruction in conjunction with the expert experiences of their instructor (Brown & Voltz, 2005). Lack of response by the online facilitator can create student dissatisfaction with courses and increase feelings of isolation that often lead to lower student satisfaction and retention (Northrup, 2005). Online facilitators must give consideration to the increased interaction requirement.

Interaction and feedback. Because of the physical separation, inexperienced online students and instructors are often skeptical about the ability of Web-based distance-learning courses to duplicate the perceived interaction normally found in a traditional classroom-learning environment (Gilbert & Moore, 1998). Student perception of interaction, or lack thereof, offered in a Web-based course may have a substantial effect on the desired instructional outcomes depending upon each student's capability to learn on his or her own. Student-

instructor dialog is a significant variable in all educational transactions and is regarded as an essential component of learning by many distance educators (Moore, 1989). Additionally, distance learners appreciate the dialog with their instructors because the dialog provided them with more flexibility and less responsibility in their course of study (Moore & Kearsley, 1996). Finally, King and Doerfert (1996) found this type of interaction crucial to student satisfaction and the retention of distance-education students.

Student satisfaction online. Novice online administrators and educators should realize that despite the fact that online instructors neither see nor hear their students, it is possible to become very familiar with them through their words. The way students express themselves and the ways in which they organize their words provide insight into who students are as individuals (Turgeon et al., 2000). When online instructors provide appropriate and timely responses to student inquiries, interactivity in online distance education can be as good as a traditional classroom, and a highly significant predictor of online course satisfaction (Marks et al., 2005).

Suggestions for Future Research

Although distance education has been around since correspondence courses in the 1800s, the application of interactive instructional technologies like Web-based instruction are still evolving in the higher-education teaching and learning environment. This study contributes to the overall body of knowledge related to distance learning and is distinctive because it is founded on a distance learning theory. However, many other areas are available for future study.

Based upon the findings of this study, more research could be conducted to determine whether student satisfaction with distance education can accurately be predicted based upon student surveys of either (a) learner autonomy or (b) need for interaction and support. Results from this study would be important to institutions engaged in the development of student-centered learning environments. The development of student-centered learning environments promote learner engagement in the types of courses and programs most suited to their individual needs.

A major distance-education stakeholder not surveyed in this study is the instructor. Multiple studies could be based upon distance instructors' characteristics and perceptions. For example, (a) Does instructor perception of instructional support affect student satisfaction with distance learning? (b) Does instructor perception of instructional support differ from student perception of instructional support for the same course? (c) Does instructor perception of student satisfaction differ from student satisfaction with distance learning for the same course? Any of these questions could be expanded into a valid study.

Only undergraduate students at a regional, comprehensive university were surveyed in this study. A series of studies differentiating between undergraduate and graduate students enrolled in online courses at varying types of higher-education institutions may explain differences in the perceptions of online students seeking their first degree versus students seeking masters or doctoral degrees. Demographics and other variables are likely to illustrate differences

between the two levels of students and what distance-learning factors are most important to each group.

Finally, additional studies could focus on specific demographic variables within a group of learners. Is online student satisfaction or success greater (a) in specific courses, (b) in specific types of course content, (c) in courses offered by particular instructors, (d) based on the gender of the student, (e) based on the students' experience with Web-based learning environments, or (f) based on the age of the student? Institutions of higher-education seeking to admit and retain distance students have a long list of topics for study.

Summary

Distance learning courses and programs, particularly Web-based offerings, have entered the mainstream of higher education (Sloan-C, 2006). Both traditional and nontraditional higher-education students, searching for new skills and abilities, are discovering new methods of acquiring the instruction they seek through the process of distance education. This migration of students to learning environments where the instructor and student are separated has many education professionals questioning the nature and quality of education at a distance (Munro, 1998).

Based upon positive and significant statistical analyses, respondents in this study were generally satisfied with their online courses and believed they provided a reasonable mix of autonomy and interaction. This study supports the change from the traditional, instructor-centered approach to that of a student-centered learning environment based on interactions supporting distant-student

needs. Current interactive, Web-based technologies now provide the means for

distance administrators and instructors to adapt online course structure and set

the appropriate level of interactive dialog to the specific abilities and needs of the

individual student. The success of online distance education may well depend

upon the ability of educational leaders to personalize the teaching and learning

process to satisfy and retain distance students (Saba, 1999).

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APPENDIXES

Appendix A

Informed Consent and DELES Survey Instrument

Insight
The SouthCentral RTEC Instrument Library and Data Repository

Home   About   Contact Us

Consent to Participate in Doctoral Study

I am required to provide you the following information because I am begging you to participate in my doctoral research study on your satisfaction with web-based instruction at UWF.

I am sincerely asking you to voluntarily complete a brief and anonymous 42 question survey that examines the relationships between: 1) the support provided by your instructor; 2) your ability to learn on your own and, 3) your satisfaction with one totally online course you are taking this semester.

There are no foreseeable risks to you for completing this anonymous survey. Your responses will be kept secure for a period of five years, after which they will be destroyed in accordance with university policy regarding the disposal of confidential documents.

Your completion of this survey could significantly improve the quality of online courses and how instructors teach these courses at the University of West Florida. Plus, you help an aging and tired doctoral student complete his final educational project......ever!

Thank you very much for agreeing to participate. If you have any questions please email me at: vburgess@uwf.edu

Sincerely,

Vance Burgess
Old Doctoral Student

Be selecting the "I Accept" button below, you are consenting to take part in this anonymous research project.

[I Accept]

Insight
The SouthCentral RTEC Instrument Library and Data Repository

Home   About   Contact Us

Demographics

Course Number
Please choose your course number

Please Select

Instructor
Please choose your instructor

Please Select

Age
Please choose your age

Please select

Online Courses
How many totally online courses have you taken?

Please Select

Gender
What is your gender?

○ Female

○ Male

[Continue to 2 out of 2]

⊑ Insight
The SouthCentral RTEC Instrument Library and Data Repository

Home   About   Contact Us

Distance Education Learning Environment Survey (DELES) Instructor Form

This survey contains 34 statements about practices that take place in this class, followed by eight statements regarding your opinion about distance education.

There are no 'right' or 'wrong' answers. Your opinion is what is wanted on each item. Please think about how well each statement describes what this class is like for you.

In this class...

	Never	Seldom	Sometimes	Often	Always
If a student has an inquiry, I find time to respond.	○	○	○	○	○
I help students identify problem areas in their study.	○	○	○	○	○
I respond promptly to student questions.	○	○	○	○	○
I give students valuable feedback on their assignments.	○	○	○	○	○
I adequately address student questions.	○	○	○	○	○
I encourage student participation.	○	○	○	○	○
It is easy for students to contact me.	○	○	○	○	○
I provide students with positive and negative feedback on their work.	○	○	○	○	○
	Never	Seldom	Sometimes	Often	Always
Students work with others.	○	○	○	○	○
Students relate their work to other's work.	○	○	○	○	○
Students share information with other students.	○	○	○	○	○
Students discuss their ideas with other students.	○	○	○	○	○
Students collaborate with other students in the class.	○	○	○	○	○
Students do group work as a part of their activities.	○	○	○	○	○
	Never	Seldom	Sometimes	Often	Always

Students relate what they learn to their life outside of

	Never	Seldom	Sometimes	Often	Always
university.	○	○	○	○	○
Students pursue topics that interest them.	○	○	○	○	○
Students connect their studies to their activities outside of class.	○	○	○	○	○
Students apply their everyday experiences in class.	○	○	○	○	○
Students link class work to their life outside of university.	○	○	○	○	○
Students learn things about the world outside of university.	○	○	○	○	○
Students apply their out-of-class experience.	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
Students study real cases related to the class.	○	○	○	○	○
Students use real facts in class activities.	○	○	○	○	○
Students work on assignments that deal with real-world information.	○	○	○	○	○
Students work with real examples.	○	○	○	○	○
Students enter the real world of the topic of study.	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
Students explore their own strategies for learning.	○	○	○	○	○
Students seek their own answers.	○	○	○	○	○
Students solve their own problems.	○	○	○	○	○

	Never	Seldom	Sometimes	Often	Always
Students make decisions about their learning.	○	○	○	○	○
Students work during times they find convenient.	○	○	○	○	○
Students are in control of their learning.	○	○	○	○	○
Students play an important role in their learning.	○	○	○	○	○
Students approach learning in their own way.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Distance education is stimulating for students.	○	○	○	○	○
Students prefer distance education.	○	○	○	○	○
Distance education is exciting for students.	○	○	○	○	○

Distance education is worth students' time.	○	○	○	○	○
Students enjoy studying by distance.	○	○	○	○	○
Students look forward to learning by distance.	○	○	○	○	○
Students would enjoy their education more if all their classes were by distance.	○	○	○	○	○
Students are satisfied with this class.	○	○	○	○	○

Submit

Appendix B

Scale Reliability of the DELES and Satisfaction Scales Using Cronbach's

Alpha Coefficient

Table B1

Scale Reliability of the DELES and Satisfaction Scales Using Cronbach's Alpha Coefficient (N = 680)

Scale	Number of items	*α Reliability*
Instructor support	8	0.87
Student interaction and collaboration	6	0.94
Personal relevance	7	0.92
Authentic learning	5	0.89
Active learning	3	0.75
Student autonomy	5	0.79
Satisfaction	8	0.95

Appendix C

Construct Validity of the DELES

Table C1

Construct Validity of the DELES

Item	Factor loading					
	Student Interaction & Collaboration	Instructor Support	Personal Relevance	Authentic Learning	Student Autonomy	Active Learning
INSTSUP1		0.69				
INSTSUP2		0.73				
INSTSUP3		0.83				
INSTSUP4		0.84				
INSTSUP5		0.80				
INSTSUP6		0.63				
INSTSUP7		0.62				
INSTSUP8		0.76				
INTER9	0.90					
INTER10	0.83					
INTER11	0.85					
INTER12	0.86					
INTER13	0.90					
INTER14	0.87					
RELEV15			0.75			
RELEV16			0.69			
RELEV17			0.81			
RELEV18			0.78			
RELEV19			0.83			
RELEV20			0.55			
RELEV21			0.70			
AUTH22				0.61		
AUTH23				0.77		
AUTH24				0.80		
AUTH25				0.84		
AUTH26				0.69		
ACT27						0.63
ACT28						0.79
ACT29						0.75
AUTON30					0.65	
AUTON31					0.65	
AUTON32					0.81	
AUTON33					0.75	
AUTON34					0.61	
%Variance	14.31	14.10	13.88	10.35	8.50	6.01

Note. Factor loadings smaller than 0.50 have been omitted. *N* = 680.

Appendix D

The University of West Florida Institutional Review Board Approval

University of
West Florida

October, 11 2005

Mr. Joseph Burgess
4340 Irongate Rd.
Pensacola, FL 32504

Dear Mr. Burgess:

The Institutional Review Board (IRB) for Human Research Participant Protection has completed its review of your proposal titled "Instructional Support, Student Autonomy and Satisfaction in Web-Based Distance Learning Courses" as it relates to the protection of human participants used in research, and has granted approval for you to proceed with your study. As a research investigator, please be aware of the following:

- You acknowledge and accept your responsibility for protecting the rights and welfare of human research participants and for complying with all parts of 45 CFR Part 46, the UWF IRB Policy and Procedures, and the decisions of the IRB. You may view these documents on the Office of Research web page at http://www.research.uwf.edu. You acknowledge completion of the IRB ethical training requirements for researchers as attested in the IRB application.

- You will ensure that legally effective informed consent is obtained and documented. If written consent is required, the consent form must be signed by the participant or the participant's legally authorized representative. A copy is to be given to the person signing the form and a copy kept for your file.

- You will promptly report any proposed changes in previously approved human participant research activities to the Office of Research and Graduate Studies. The proposed changes will not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the participants.

- **You are responsible for reporting progress of approved research to the Office of Research and Graduate Studies at the end of the project period. Approval for this project is valid for one year. If the data phase of your project continues beyond one year, you must request a renewal by the IRB before approval of the first year lapses. Project Directors of research requiring full committee review should notify the IRB when data collection is completed.**

- You will immediately report to the IRB any injuries or other unanticipated problems involving risks to human participants.

Good luck in your research endeavors. If you have any questions or need assistance, please contact the Office of Research and Graduate Studies at 857-6378.

Sincerely,

Dr. Keith Whinnery, Chair
IRB for Human Research
Participant Protection

Ms. Sandra VanderHeyden
Director of Sponsored Research

cc: Dr Pam Northrup
    Dr. Richard Podemski

Appendix E

DELES Learner Autonomy Scale Items, Interaction and Support Scale Items and

Student Satisfaction Items with Mean, Standard Deviation, and Population

DELES Learner Autonomy Scale Items, Interaction and Support Scale Items and Student Satisfaction Items with Mean, Standard Deviation, and Population.

Five Learner Autonomy Scale Items (M = 4.55; SD = .54; N = 237)

Item	Never=1	Seldom=2	Sometimes=3	Often=4	Always=5
I make decisions about my learning.					
I work during times I find convenient.					
I am in control of my learning.					
I play an important role in my learning.					
I approach learning in my own way.					

Eight Interaction and Support Scale Items (M = 4.20; SD = .97; N = 237)

Item	Never=1	Seldom=2	Sometimes=3	Often=4	Always=5
If I have an inquiry, the instructor finds time to respond.					
The instructor helps me identify problem areas in my study.					
The instructor responds promptly to my questions.					
The instructor gives me valuable feedback on my assignments.					
The instructor adequately addresses my questions.					
The instructor encourages my participation.					
It is easy to contact the instructor.					
The instructor provides me positive and negative feedback on my work.					

Eight Student Satisfaction Scale Items (*M* = 3.81; *SD* = 1.04; *N* = 237)

Item	Strongly Disagree =1	Disagree =2	Neither Agree or Disagree=3	Agree =4	Strongly Agree=5
Distance education is stimulating.					
I prefer distance education.					
Distance education is exciting.					
Distance education is worth my time.					
I enjoy studying by distance.					
I look forward to learning by distance.					
I would enjoy my education more if all my classes were by distance.					
I am satisfied with this class.					