

AN INVESTIGATION OF UNDERGRADUATE AND GRADUATE STUDENTS'
PERCEPTIONS OF ONLINE INTERACTION

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ABSTRACT

AN INVESTIGATION OF UNDERGRADUATE AND GRADUATE STUDENTS' PERCEPTIONS OF ONLINE INTERACTION

Myong Sun Kim

In this study, undergraduate and graduate students' perceptions of online interaction, and reasons students choose to take online courses were investigated. The results of this study indicated that students perceive online learning as a key element for their success and persistence in online learning. There was a significant difference between undergraduate and graduate students' perceptions of content interaction. Whereas more graduate students reported that they enjoy courses that are partially individualized with some instructor direction, undergraduate students reported that they enjoy innovative content interaction strategies. There were no significant differences among conversation and collaboration, intrapersonal/metacognitive, and support interactions. Both groups of students identified timely feedback from the instructor and monitoring of one's own progress as important factors in learning online. In addition, the majority of students reported that they take online courses for convenience and flexibility, and over 50% of students indicated that they could not attend school if courses were not online.

CHAPTER I

INTRODUCTION

Background of the Study

Advancing technology has significantly impacted the field of higher education. More colleges and universities offer distance education courses that are alternatives to traditional classroom-based courses. The researchers at the National Center for Education Statistics (NCES) reported that nearly 90% of all public higher educational institutions offered distance education courses (Waits & Lewis, 2003). Once considered as an anomaly, distance learning has become accepted and is often expected in higher education (Kretovics, 2003).

Distance learning has a long history; however, the field is being recreated with strength as the Internet and the World Wide Web (WWW or the Web) and other computer technologies have led to innovations in distance learning delivery. Access to the Internet is no longer a privilege for a few, but is widely available and accepted by the public. Use of the Internet and Web technologies for educational purposes has played a considerable part in its growth. The NCES researchers found that approximately 90% of the educational institutions offering distance courses have used Internet and Web technologies as the primary modes of instructional delivery; furthermore, these institutions plan to expand distance education courses using the Internet and the Web

(Waits & Lewis, 2003). As most educational institutions use the Internet and Web resources for their instructional delivery, the term *distance learning* has become interchangeable with *online learning* or *Web-based learning* (Ally, 2004; Hoyle, 2004; Moore & Kearsley, 1996; Picciano, 2001).

Another driving force that has contributed to the tremendous growth of distance learning is the response to an increasing demand for lifelong learning opportunities and the need of flexible learning for adult learners (Howell, Williams, & Lindsay, 2003). The rapid pace of technological advancement affects every sector of the economy, creating a need for lifelong learning opportunities (Levine, 2001). Researchers have estimated that half of what most professionals know when they complete their training will be obsolete in fewer than 5 years, and even fewer years for those in technology-related fields (Merriam & Caffarella, 1999). Workers must upgrade knowledge and skills continuously. For example, physicians may have to learn a new medical procedure using the latest technology, or teachers may need to learn the use of new technology in the classroom. As changes in the workplace continue, lifelong learning has become a necessity (Aslanian, 2001). The leaders of businesses, as well as those of nonprofit organizations and government agencies, are recognizing that their competitiveness, innovation, and long-term sustainability are dependent on employees' continually engaging in the learning process. Already the annual amount spent by business, industry, and government agencies on job-related training exceeds that of the annual amount spent on public higher education (Botkin & Kaipa, 2004). Not surprisingly, adult learners are the fastest growing population in higher education (Aslanian). While some adults may return to school with the intention of making a career change, the majority of adults are engaged in learning to maintain or upgrade their skills for current employment (Picciano, 2001).

Most distance education courses using the Internet and computer technology are asynchronous in nature, allowing learners to learn without constraints of a specific time and place (Berge, 1999; Northrup, 2001; Olgren, 2000; Waits & Lewis, 2003). Since a specific time and place are not required, a distance education course is a welcome alternative for individuals who are unable or unwilling to attend traditional classroom-based courses. One of the main benefits of distance learning is, in fact, its ability to reach segments of the population who otherwise would not have access to learning opportunities (Moore & Kearsley, 1996). Adults who have family or work responsibilities now can earn a degree or a certification without having to be away from their home or workplace. The primary reasons for taking distance courses are the convenience and flexibility offered by distance learning (Diaz, 2000; Northrup, 2002; Salinas, 2002). Not surprisingly, the majority of distance learners are older than the traditional college age student and have family and/or work responsibilities (Aslanian, 2001; Moore & Kearsley; Picciano, 2001; Waits & Lewis). Distance learning offers convenience and flexible learning opportunities; however, it also contains challenges. One specific challenge, interaction in distance learning, is discussed in the following section.

Statement of the Problem

The effectiveness of distance learning is well documented. Researchers have reported that students learning from a distance perform as well as students in a traditional classroom (Keegan, 1996; Kretovics & McCambridge, 2002; Levine, 2001; Moore & Kearsley, 1996; Mulligan & Geary, 1999; Russell, 1999; Worley, 2000). Other researchers have found that distance learners often outperform their traditional

counterparts (Diaz, 2000; Navarro & Shoemaker, 1999; Smeaton & Keogh, 1999). However, one of the critical issues in distance education is a high attrition rate (Boghikian-Whitby, 2003; Carr, 2000; Diaz, 2002; Palloff & Pratt, 2003). While reported rates vary among institutions, attrition rates for distance courses have been consistently higher than those of traditional classroom-based courses (Berge & Huang, 2004; Carr; Diaz; Howell et al., 2003; Moore & Kearsley; Phipps & Merisotis, 1999; Saenz, 2002). Others have reported distance education course attrition rates as high as 30% to 50%, an increase of 10% to 20% over rates for traditional face-to-face courses (Carr; Diaz; Picciano, 2001). Since the course completion rate is considered one of the key elements in determining the quality of distance education programs, increasing retention has become a goal of many educational institutions (Berge & Huang).

Distance learning offers convenience and flexibility for learners, but it also can generate specific challenges for some learners since they are physically separated from the instructor and other learners (Berge, 1999; Northrup, 2001, 2002; Picciano, 2001). These challenges include overcoming a feeling of isolation, learning new ways to interact with the instructor and fellow learners, and adapting to the self-directed nature of distance learning (DeTure, 2004; Northrup, 2002). Furthermore, the distance in distance learning is more than the physical distance; it is also perceived psychological distance, which is recognized as a mental separateness or dissimilarity between people (Moore, 1993; Wolcott, 1996). Psychological distance contributes to learners' feelings that they are not part of the learning community, and this perception keeps learners at a distance (Wolcott). These challenges can impact distance learners' course completion and contribute to the lower retention rates found in distance learning (DeTure).

It is difficult to determine the exact contributing factors for student dropout from a distance course; however, Northrup (2002) suggested that when schools are attempting to increase retention, one of the variables worthy of investigation is interaction. Other educators and researchers have also identified interaction as one of the key factors that influence learner persistence in distance learning (Anderson, 2003; Berge, 1999; Carr, 2000; McCombs, 2000; Moore, 2000; Picciano, 2001; Tillman, 2002).

Purpose of the Study

The purpose of this study was to investigate students' perceptions of online learning interaction and to explore the difference between undergraduate and graduate online learners' perceptions. In addition, the reasons students choose to take online courses were investigated. Northrup (2002) focused on the investigation of online interaction that graduate students perceived to be important in online learning. Building upon the previous studies, this study expanded the scope of investigation to include undergraduate students because a majority of online courses are at the undergraduate level, yet a higher percentage of undergraduate students reported to be less satisfied with online courses (Waits & Lewis, 2003).

Importance of the Study

The fact that growing numbers of researchers have focused their attention to the topic demonstrates the importance of interaction in online learning. Researchers have reported that interaction is an important variable for the learners' academic successes in distance learning (Berge, 1999; Carr, 2000; McCombs, 2000; Moore, 1989, 2000; Northrup, 2001, 2002; Picciano, 2002; Tillman, 2002; Wegerif, 1998). Furthermore, researchers found that interaction influences learner satisfaction, which affects learners'

persistence in distance education courses (Berge; Navarro & Shoemaker, 2000; Northrup, 2002). The researchers concurred that learners' perspectives of interaction are important in online learning (Anderson, 2003; Berge; Gilbert & Moore, 1998; Northrup, 2002; Salinas, 2002); however, studies related to learners' perspectives in online interaction are limited (Berge; Yacci, 2000). A considerable number of studies have been conducted on interaction in an online learning setting, but the majority of these studies have given little attention to the learner's perspective (Berge; Yacci). Online learning interaction studies have mostly focused on instructional perspectives, such as measuring the frequency of participation in online discussions, comparing advantages and disadvantages of online and face-to-face discussions, and identifying the types of interaction (Picciano).

Northrup (2002) investigated the interaction attributes that students perceived to be important for online learning. Her study is notable for focusing on the learners' perspectives of interaction, as well as investigating various aspects of online learning interaction. Participants were graduate students in an online master's degree program, and they reported that interaction was a critical factor to their success as distance learners. Moreover, participants reported that the timely feedback from the instructor and support personnel is the key influencing factor in maintaining learners' motivation for persistence. Northrup also found that the indicators related to the intrapersonal interaction attribute with self-monitoring skills were highly valued. With lack of visual and facial cues, online learners can easily misinterpret the meaning of communication in the online learning environment (Dillon & Greene, 2003; Northrup). Some online learners may interpret a high level of feedback from an instructor as a positive signal, while other learners may perceive it as a negative signal when in reality the instructor is posing questions to stimulate learners' thinking. Some instructors may assume that the more

interaction the better, but high frequency of online interaction is not always perceived as quality by online learners; rather it can be perceived as just busywork that can lead online learners to frustration. These differences indicate the importance of investigating learners' perspectives of online learning interaction (Northrup).

Furthermore, there was a need to expand the study to investigate undergraduate online students, as well as to examine a possible difference between undergraduate and graduate online students' perceptions. Among the over 3 million enrollments in all United States distance courses in the 2000-2001 academic year, 82% were at the undergraduate level; a higher number of undergraduate students reported to be less satisfied with online learning courses than the graduate students (Waits & Lewis, 2003). Further investigation is necessary because no reasons were given for the higher number of dissatisfied undergraduates. Expanding the scope of this study to include undergraduate students and how they perceive online interaction may provide insights to the reasons for the higher rate of undergraduate online students' dissatisfaction. Moreover, there was a need to examine a possible difference between undergraduate and graduate students' perspectives of online learning interaction. Researchers reported that there are differences in how students interact in relation to individuals' age and undergraduate or graduate status (Furst-Bowe, 2001; Salinas, 2002; Vafa, 2002). Vafa found that undergraduate online students preferred to learn with a group and other students, but graduate online students preferred to learn alone. Other researchers also reported a difference in preferences for group interaction; younger online learners found group interaction to be stimulating and motivating, but group interaction was not so important for older and advanced learners, who tend to be self-motivated (Furst-Bowe; Salinas). Although researchers investigated the difference between undergraduate and graduate

students' perceptions of online interaction, their studies were limited to examining particular aspects of online interaction. No literature was found that examines the difference between undergraduate and graduate students' perceptions of the various aspects of online interaction that Northrup (2002) has defined.

Understanding students' perspectives of online interaction can aid instructors in selecting appropriate interactive strategies and facilitating courses more effectively (Berge, 1999; Diaz, 2000; Northrup, 2002). The context of online learning is still very much in a fluid and changing stage, and new situations created through new technology require ongoing study in the online learning environment (Anderson & Elloumi, 2004; Picciano, 2002). While instructors can draw insights from the past research, continuous investigation focusing on the learner's perspective is needed (Diaz; Picciano). By investigating the interaction that influences student persistence in online learning, educators may come to better understand the retention problem in distance learning (DeTure, 2004).

Research Questions

In this study the researcher aimed to investigate students' perceptions of online learning interaction and to examine a possible difference between undergraduate and graduate students' perceptions. In addition, the reasons students choose to learn online were explored. Three specific research questions were investigated in this study as listed below:

1. How do students perceive interaction in online learning?
2. What are the differences between undergraduate and graduate students'

perceptions of online interaction?

3. Why do students choose to take online courses?

Working Definitions of Terms

Asynchronous communication. In the context of distance learning, *asynchronous communication* means that the learners and the instructor do not have to be present at the same time to conduct learning or teaching events (Picciano, 2001).

Attrition. Attrition is a decline in the number of students from the beginning to the end of the course, program, or institution under review (Berge & Huang, 2004).

Distance learning. Distance learning is a learning situation in which the learner is physically separated from the instructor and other learners and uses some form of technology to access learning materials and interact with the instructor and other learners (Picciano, 2001).

Graduate online student. A graduate online student is a learner who is enrolled in a graduate-level online course.

Internet. The Internet is the network of networks that provides the basic protocol standard for allowing data communications systems to link themselves together throughout the world (Picciano, 2001).

Synchronous communication. Synchronous communication occurs in real time. The participants in the interaction must be present, though not necessarily physically (Picciano, 2001).

Undergraduate online student. An undergraduate online student is a learner who is enrolled in an undergraduate-level online course.

World Wide Web (WWW or the Web). The Web is the protocol and software incorporating hypertext, multimedia, and communication capabilities for use on the Internet.

Chapter Summary

This chapter included the description of the overall plan for the study, including the statement of the problem, the purpose and importance of the study, and the three specific research questions for investigation. The chapter ended with the working definitions of key terms used in this study.

CHAPTER II

REVIEW OF THE LITERATURE

In this chapter, three major areas of literature relevant to this study are presented and discussed. The first section is related to the field of distance learning. The topics of distance learning include the reasons for its rapid growth, the effectiveness and benefits of distance learning, and the critical issue of high attrition rates. The next section is focused on adult learners because research has indicated that the majority of distance learners are adult learners (Waits & Lewis, 2003). The section includes the review of three specific adult learning theories and characteristics of adult learners. Finally, the last section is a discussion of the conceptual frameworks of online interaction and the importance of interaction in an online learning context.

The Field of Distance Learning

The field of distance learning is growing rapidly and is expected to grow continuously. The accessibility of advanced technologies and increasing demand for flexible learning opportunities are the primary driving forces for the growth of distance learning (Kretovics, 2003). The literature review for this section focuses on the historical perspectives of distance learning, the reasons for its growth, the effectiveness of distance learning, and the critical issue of high attrition in distance learning.

Definitions of Distance Learning

Distance learning refers to a learning situation in which the learner is physically separated from the instructor and other learners and uses some form of technology to access learning materials and interact with the instructor and other learners (Ally, 2004; Hoyle, 2004; Moore & Kearsley, 1996; Picciano, 2001). The technologies being used in distance learning in the United States are commonly referred to as Taylor's (1995) fourth-generation delivery technologies, particularly the Internet technology including the Web resources and other computer-mediated communications (Keegan, 1996; Waits & Lewis, 2003). For this reason, the term *distance learning* is often synonymously used with *online learning* or *Web-based learning* in the literature (Ally; Hoyle; Moore & Kearsley; Picciano). In this study, these terms are also used interchangeably.

Historical Perspectives of Distance Learning

Distance learning is not a new idea. From the form of correspondence study in the 18th century, it has evolved continuously over time (Abernathy, 2000). Taylor (1995) described the progress of distance learning delivery technologies in four *generations*. The first generation is referred to as the correspondence model. This model includes the use of printed materials to deliver instructions and communicate between learners and their instructor. The second generation is referred to as the multimedia model. This model includes the use of audiotape and videotape in addition to printed materials. The third generation is referred to as the telelearning model. This model includes the use of radio or television broadcasting methods as well as printed or audiotape materials. The fourth generation of distance learning is referred to as the flexible learning model. In addition to

the previous models' delivery methods, this model includes the use of Internet, Web resources, multimedia, and various computer-mediated communications. This model is highly flexible with regard to time and place, as well as the pace of learning (Taylor).

Although some distance learning courses are still conducted via the first three generations of delivery methods outside of the United States, the term *distance learning* in the United States is generally applied to the use of Taylor's fourth-generation delivery methods, especially use of Internet technology with Web resources in a distance learning situation (Keegan, 1996; Moore & Kearsley, 1996). Among institutions offering distance courses, nearly 90% reported that they offered Internet courses using asynchronous Web-based instruction (Waits & Lewis, 2003). Internet technology, including Web resources, was the primary mode of instructional delivery for distance learning courses during the 2000-2001 academic year. The availability of advanced technologies and the accessibility of the Internet revolutionized many aspects of distance learning, enabling instructors and learners to connect across virtual space and time (Picciano, 2001).

Reasons for the Growth of Distance Learning

Not only is the nature of distance learning changing, the field of distance learning is also growing rapidly. Researchers reported that the number of students enrolling in distance courses increased from 1.7 million to 3.1 million between the 1997-1998 and 2000-2001 academic years (Wirt, Rooney, Choy, Provasnik, Sen, & Tobin, 2004). Researchers found that 90% of public 2-year institutions and 89% of public 4-year institutions offered distance education courses and planned to expand their distance education programs. In addition, researchers found that the institutions not currently

providing distance courses planned to start offering distance courses within a few years (Waits & Lewis, 2003).

One of the reasons for the growth of distance learning is the accessibility of advanced technologies. The increasing number of personal computers and Internet subscribers has fueled the growth of distance learning. Internet technology as well as Web resources have become a powerful environment for an instructional delivery system; and using the Internet and Web technologies, educators can tailor instructional programs to a variety of learning formats to meet diverse learning needs (Olgren, 2000; Surjono & Maltby, 2003).

Another driving force for the rapid growth of distance learning is an increasing demand for lifelong learning opportunities (Howell et al., 2003; Merriam & Caffarella, 1999). As businesses and organizations incorporate advanced technologies into their business practices, workers' knowledge and skills become obsolete more quickly. In the past, it was predicted that the amount of information would double every 10 years, but now the amount of information is predicted to double every 7 years or sooner (Aslanian, 2001; Botkin & Kaipa, 2004). Also, people change careers more often. Lifetime employment is no longer applicable in the information age society (Cetron & Davies, 2003). The changing nature of the workforce in the information age necessitates continuous learning and retraining, making lifelong learning a necessity. Leaders in businesses and organizations are recognizing that employees are vital to competitiveness in the market and that long-term sustainability is dependent on the knowledge and skills of employees (Botkin & Kaipa). Consequently, employers view employee education and training costs as an investment rather than an expense, and employers encourage or even

require employees to update knowledge and skills continuously (Cetron & Davies).

Approximately 85% of Fortune 500 companies provide some form of financial or time incentives for their employees' continuing education and training (Markel, 1999).

Business and corporations spend more than \$60 billion annually on employee training, and government agencies spend an additional \$40 billion on employee education and training (Aslanian; Botkin & Kaipa). The training and professional development cost for business and government agencies surpasses the combined annual budgets of all public colleges and universities (Botkin & Kaipa). The need to train the workforce has contributed to the rising number of adult learners (Aslanian).

All these factors have contributed to the increasing demand for flexible learning opportunities and have significantly impacted the growth of distance learning in higher education (McCombs, 2000). Educators and researchers view distance learning as a growing field, not as a passing trend. They have cautioned, however, that the growth of distance learning does not lie in the notion that there is something wrong with traditional classroom education, nor that distance learning is a replacement for traditional classroom learning (Keegan, 1996; Kretovics, 2003). Distance learning is viewed as an acceptable alternative educational opportunity for those who are unable or unwilling to participate in the traditional classroom setting.

Benefits and Effectiveness of Distance Learning

The primary benefit of distance learning is that it could be an alternative educational opportunity to individuals who otherwise would not have access to the traditional classroom-based learning opportunities (Moore & Kearsley, 1996). Rural learners can take courses previously available only to learners in city areas. Disabled

learners now can have access to the same courses as everyone else, even if they are homebound or institutionalized. Adults who have family and work responsibilities can take distance courses without having to be away from home or their current jobs. The flexibility of asynchronous distance courses provides educational opportunities for those who may not be able to fit classroom-based courses into their already demanding schedule (Moore & Kearsley; Oblinger, Barone, & Hawkins, 2001). Furthermore, the effectiveness of distance learning is well recognized; study results have consistently shown that distance learning is just as effective as traditional classroom learning when measured in terms of learner achievement (Keegan, 1996; Kretovics & McCambridge, 2002; Levine, 2001; Mulligan & Geary, 1999; Russell, 1999; Worley, 2000). Russell conducted a metaresearch study on distance learning by analyzing 355 studies, reports, and dissertations to determine whether any statistically significant differences exist between distance learning and traditional classroom learning. He found no significant difference in learning achievement between distance learners and traditional classroom learners. Other studies have focused on the end-of-course grade, and researchers have found that distance learners often outperform their traditional counterparts (Diaz, 2000; Navarro & Shoemaker, 1999; Smeaton & Keogh, 1999). Diaz, for example, compared the academic performance of online and traditional, face-to-face health education students. He found that the online students performed better than their counterparts: Students who persisted in online classes displayed a higher number of *A* grades and a fewer number of *D* and *F* grades than did the traditional face-to-face students. However, he also found that a higher number of students dropped out of online courses than did students in the traditional classroom courses.

Attrition Issue in Distance Learning

One of the critical issues in distance learning is the high attrition rate (Carr, 2000; Moore & Kearsley, 1996; Palloff & Pratt, 2003). Although no national attrition data exist, researchers have reported that attrition rates for distance courses have been consistently higher than those of traditional classes (Berge & Huang, 2004; Carr; Diaz, 2000; Howell et al., 2003; Moore & Kearsley; Phipps & Merisotis, 1999; Saenz, 2002). The reported attrition rates vary among institutions anywhere from 30% to 50%, and distance course incompleteness rates are often 10% to 20% higher than those of traditional courses (Carr). Diaz performed a comparative study over three semesters that also indicated approximately 50% higher attrition rate for distance courses than for traditional classroom courses.

The course completion rate has become one of the primary deciding factors of the quality of distance education programs and institutions (Berge & Huang, 2004; Palloff & Pratt, 2003). Currently, course completion rates are being used widely by states and the accrediting community as a measure of institutional performance, as well as one of the leading indicators of academic quality in the computation of institutional scores for the *U.S. News and World Report's* annual college rankings (Johnstone, 2004). There is also an economic consideration. After initial investments of creating infrastructure for distance learning programs, the perception may be that the distance education cost is lower than traditional education because there are no classrooms or physical buildings to maintain. However, the cost per graduate in distance education programs could be higher than that of traditional classroom education programs when the high attrition rate is considered in the cost analysis (Annetta, 2004). Investigating variables that influence

attrition and finding ways to retain distance learners are important tasks to ensure learners attain their educational goals and to improve the quality of distance education programs while reducing the cost. The next section is focused on adult learners because the majority of distance learners are adults.

Adult Learners

To facilitate the learning process effectively, it is important to know the characteristics of learners and the way they learn (Merriam & Caffarella, 1999). One of the common characteristics of people who participate in distance learning is that they are adult learners. The majority of them are older than traditional college students and have job and/or family responsibilities (Picciano, 2001; Sciuto, 2002). In fact, most distance learning programs are targeted to adults, particularly those professionals seeking promotions or workers seeking to update skills and knowledge (Picciano). Distance education institutions convey messages to these individuals that the distance education program is not only a portal to an academic degree but also a pathway to social and economic upper mobility (Carriuolo, 2002). Learning at any time and any place is particularly appealing to adult learners who must juggle family and/or work responsibilities. This section is focused on adult learners, including the definitions of *adult learner* as well as three specific theoretical frameworks related to adult learning.

Definitions of an Adult Learner

While *adult* can be narrowly defined as an individual who is older than 24 years (Aslanian, 2001; Howell et al., 2003; Picciano, 2001; Waits & Lewis, 2003), *adult* can be broadly defined as an individual old enough to be held responsible for his or her actions

(Mezirow, 2000). Also, the definition of *adult* may reflect any of four different perspectives: (a) biological, (b) legal, (c) social, and (d) psychological (Knowles, 1990). According to Knowles, *biological perspective* refers to a view based on the age at which a person can reproduce; *legal perspective* refers to a view based on an individual's ability to vote and marry without parental consent; *social perspective* refers to a view based on an individual's ability to perform adult roles such as worker or parent; and *psychological perspective* refers to a view based on an individual's arrival at a self-concept of being responsible for his or her own life. Adopting Knowles' definition, a learner who has one or more of the adult characteristics mentioned above is considered an adult learner for the purpose of this study.

Theoretical Frameworks for Adult Learning

A learning theory or model provides a common framework and vocabulary that explain how individuals learn (Moore & Kearsley, 1996; Smith & Ragan, 1999). Although some researchers consider a model to be the beginning stage of development of a theory, others make no distinction between the two and use the words synonymously (Anderson & Elloumi, 2004; Thomas, 2000). A theory that explains how adults learn has been one of the major interests of adult educators and researchers, and the attention to adult learning theory has increased as more adults participate in distance learning (Martinez, 2003). While there is no single adult learning theory or model that explains all about an adult as a learner, there are a number of adult learning theories and models that explain some aspects of adults as learners (Merriam & Caffarella, 1999). Some of these theories and models have drawn more attention among adult educators and researchers.

Among them are the andragogy theory (Knowles, 1984, 1990), characteristics of adult learners model (Cross, 1981), and proficiency theory (Knox, 1980, 1986).

Theory of andragogy. Malcolm Knowles (1984, 1990; Knowles, Holton, & Swanson, 2005) believed that adults learn differently from children. He presented the theory of andragogy as the “art and science of teaching adults,” while referring to the theory of pedagogy as the “art and science of teaching children” (Knowles, 1990, p. 28). To understand Knowles’ perspective of adult learning, it is helpful to look at the origin of pedagogy. Unlike adult learning theories, pedagogy has a long history. The origin of the pedagogical model stems from the seventh century when children in Europe were being prepared for the priesthood in cathedral or monastic schools. In these educational organizations, religious teachers indoctrinated children in the beliefs, faith, and rituals of the church. Over time, the leaders and teachers of the church developed a model with a set of assumptions for teaching children. This model derives from a teacher-directed process. While the learner assumes the passive and submissive role, the teacher makes all decisions regarding “what will be learned, how it will be learned, when it will be learned, and if it has been learned” (Knowles, 1990, p. 28). This early version of the pedagogical model became the basis of our organized educational system of primary, secondary, and post-secondary schools. However, the assumptions of andragogy are that adult learners are self-directed and responsible individuals who take an active role in their learning decisions. The theory of andragogy was developed in recognition of the rich life experiences that adult learners bring into the learning environment (Knowles, 1990).

According to Knowles (1984, 1990), andragogy is based on six assumptions that describe the characteristics of adult learners. The first assumption of andragogy is that

adult learners need to know why they need to learn, whereas the assumption of pedagogy is that learners rely on teachers to define what they need to know. The need may vary for individuals, but generally adults need to know why they are taking time from busy schedules to learn. The second assumption is that the adult learners have the self-concepts of personal responsibility and self-directedness, whereas the assumption of pedagogy is that learners accept a dependent relationship from their teacher. Adult learners may come from different backgrounds, but they generally consider themselves as individuals who are responsible and able to manage their lives. The third assumption is that adult learners bring rich life experiences to their learning process, whereas the assumption of pedagogy is that learners have little personal experience to draw on. Adults define themselves by their experiences as workers, spouses, and/or parents. Knowles argued that experiences are something that happens to children, but experiences make adults who they are. Moreover, adult learners draw on their personal experiences and prior knowledge to make meaning out of new material learned (Merriam & Caffarella, 1999). The fourth assumption of andragogy is that adult learners approach learning with a different time perspective from that of younger learners. Adult learners are more willing to learn skills and knowledge that they can immediately apply to their real-life situations, whereas the assumption of pedagogy is that learners learn for the future and accept the teachers' decisions about what and when to learn. The fifth assumption deals with the learner's orientation to learning. The assumption of andragogy is that adult learners are generally focused on task-oriented or problem-oriented learning that can be applicable immediately in real life contexts, whereas the assumption of pedagogy is that learners have a more subject focused and future orientation to learning. Adult learners are more likely to learn

if they perceive that the new skills and knowledge will help them to perform tasks or deal with problems more effectively in real-life situations. The final assumption, which Knowles added later, is the motivation factor. Although adult learners are responsive to some external motivators, such as promotion or salary increase, adult learners are more intrinsically motivated to learn, whereas the assumption of pedagogy is that learners are motivated to learn by external motivators, such as a better grade or parental pressure.

The theory of andragogy has gained approval of many adult educators, who have adopted Knowles' principles in their teaching (Berge, 1999); however, andragogy has been the subject of considerable debate and criticism. Some critics have suggested that the assumptions of andragogy are merely descriptions of adults, not a theory (Merriam & Caffarella, 1999). Knowles (1990) acknowledged that andragogy might not be a fully developed theory of adult learning, but rather a conceptual framework that serves as a basis for an emergent adult learning theory. Another area of criticism focused on Knowles' earlier presentation of andragogy as the opposite of pedagogy. Knowles first presented andragogy as the model for adult learning, contrasting it to pedagogy as the model for the education of children. Critics, however, argued that age could not be the only determining factor because some children may meet one or more of the assumptions of andragogy (Merriam & Caffarella). While some adults may bring a strong desire for self-directed learning, some may cling to the kind of dependency on authority that they remember from earlier years. An adult who returns to the learning environment after many years or knows little about the subject will be more dependent on the instructor for direction, whereas some children who are naturally curious are sometimes more independent and self-directed learners. The idea that adults are naturally self-directed is a

myth (Orange, 1999). Adults may demonstrate self-direction in their personal lives or at work, but they may not carry self-directedness over to a learning situation. Also, adults are not always intrinsically motivated to learn. Adults may be externally motivated to learn at times, and children may be internally motivated to learn by curiosity or just joy of learning. Therefore, andragogy may not always be appropriate for adults, and pedagogy may be more appropriate for adult learners depending on the situation (Merriam & Caffarella).

Characteristics of adult learner model. Cross (1981) presented the characteristics of adults as learners (CAL) model as a “bare-bones” conceptual framework for thinking about how adults learn. Similar to andragogy, the CAL model focuses on the personal and situational characteristics of adult learners. According to Cross, personal characteristics have three dimensions: (a) physiological, (b) sociocultural, (c) and psychological. These three dimensions are continuous in nature and reflect growth and development from childhood into adult life. An illustration of physiological dimension might be the changes taking place as an individual ages. Aging results in the deterioration of certain physical abilities (e.g., eyesight and hearing), but may improve mental abilities (e.g., reasoning and decision-making skills). Sociocultural and psychological dimensions involve a series of transitions that may not be directly related to age, moving through different life phases, or developmental stages. These personal characteristics are almost always considered continuous. They represent the gradual growth of children into adults and are expressed as growth or developmental continua along the three dimensions.

Unlike the personal characteristics, the situational characteristics show dichotomous relationships in learning participation. Some learners may be required to

participate in learning full time, whereas others may have the option of learning part time. Some learners may be required to learn specific skills and knowledge to perform their job, whereas others may voluntarily learn to enhance their personal growth. Situational characteristics do not represent the continuous growth of children into adults; rather, they represent differences in the extent to which the variable operates in adult learning situations.

Cross (1981) indicated that her purpose in developing CAL was to describe different characteristics between adults and children to help adult educators develop alternative instructional strategies for adult learners. Individuals differ in age, life phases, and developmental stages. Their learning situations also vary. Cross considered these differences of adult learners and recognized the necessity for different approaches to accommodate the different personal and situational characteristics of adult learners. One of the limitations of the CAL model is that the model focuses on the characteristics of adults, not on how they learn differently from children. Also, the three dimensions of personal characteristics are not exclusive to adult learners. Because the characteristics develop in a continuum from childhood into adulthood, the personal characteristics she described can be found in children as well as adults (Merriam & Caffarella, 1999).

Proficiency theory. Knox (1980) defined *proficiency* as “the capability to perform satisfactorily if given the opportunity” (p. 378), with *performance* referring to some combination of attitude, knowledge, and skill. The essence of the proficiency theory is that by understanding the discrepancies between current and desired proficiencies, instructors can better assess educational needs, guide learning activities, evaluate progress, increase proficiency, and encourage persistence in learning. Understanding the

discrepancies between current and desired proficiencies helps to explain motives of adult learners and enables those who help adults learn do so responsively and effectively. The proficiency model contains a number of interactive elements, including the general and specific environment and the past and current characteristics of learners. These interrelated elements center on what Knox defines as the purpose of adult learning, which is to enhance proficiency to improve performance. Instructors can better understand these interactive elements of adult learners by encouraging learners' self-reflection and engaging conversation with learners to develop learning plans to increase proficiencies to the desired level.

Knox (1986) distinguished his proficiency-oriented learning from competency-based learning, believing that proficiency-oriented learning has potential for helping adults achieve the highest possible level because proficiency-oriented learning focuses on the achievement of optimal standards of proficiency. On the other hand, competency-based learning focuses on the achievement of minimal standards of performance in the educational task. This concept of promoting excellence or optimal learning remains an attractive feature of proficiency theory (Merriam & Caffarella, 1999). Unfortunately, Knox's theory of proficiency is not well known among adult educators. One of the reasons could be that its publication has been outside the field of education.

Adult Learning Theories and the Distance Educator

Despite the limitations and criticisms, distance educators can draw insights from adult learning theories (Salinas, 2002). Since the majority of distance learners are adults (Waits & Lewis, 2003), it is important for distance educators to understand how adults learn. Adult learning theories are not replacements for pedagogy; depending on the

learning goals, there are times that the pedagogical approach is an appropriate instructional strategy (Martinez, 2003). However, adult learning theories have the potential to balance the rigid, subject-centered, and teacher-directed pedagogical approach with more effective instructional strategies for adult learners (Merriam & Caffarella, 1999). Treating learners as adults represents a fundamental shift in how instructors think about the process of learning and the selection of instructional strategies for adult learners. Placing the learner at the center of the process of learning changes the instructor's role from dispensing knowledge to facilitating the learning process. Instructional strategies for adult learners should capitalize on the experience of learners and provide adequate choices in the availability as well as organization of learning programs. Distance educators can create more effective learning opportunities by incorporating the principles of adult learning and helping learners to persist in learning at a distance.

Interaction in Distance Learning

Interaction is a critical factor in distance learning and is an important component of a successful instructional program (Northrup, 2001, 2002; Palloff & Pratt, 2001; Picciano, 2002). Carefully designed and facilitated instructional strategies that allow students to interact and engage in learning may help them to complete a distance course (Saenz, 2002). This section contains the definition of *interaction* in the context of distance learning, the importance of interaction, and the theoretical frameworks of interaction in distance learning.

Definitions of Interaction

Interaction has been interpreted from many perspectives for online learning (Northrup, 2002). With multiple definitions of *interaction*, it is difficult to find a precise common definition (Bannan-Ritland, 2002; Berge, 1999; Gilbert & Moore, 1998). Wagner (1997) focused on the human element, suggesting that interaction is an interplay and exchange in which individuals and groups influence each other. On the other hand, Gilbert and Moore emphasized the significance the medium plays in the process of interaction because most online interaction occurs through some type of technology. They suggested interaction as a reciprocal exchange between the technology and the learner. Proposing a broader perspective in the context of online learning, Berge included both human and nonhuman elements, defining *interaction* as follows:

Interaction is a two-way communication between two or more individuals within a learning context, with the purpose of completing an instructional task or for building a social relationship, that includes a means for instructor and learner to receive feedback and for adaptation to occur based upon information and activities with which the individuals are engaged. (p. 6)

Because this study was focused on interactions of both human and nonhuman elements in online learning, Berge's definition of *interaction* was used for the study.

Importance of Interaction in Distance Learning

Researchers and educators have identified interaction as one of the important elements for success in distance learning and for learner satisfaction which helps in maintaining the persistence of distance learners (Bannan-Ritland, 2002; Berge, 1999;

Draves, 1999; Dziuban & Moskal, 2001; Ehrlich, 2002; Furst-Bowe, 2001; Keegan, 1996; Moore & Kearsley, 1996; Northrup, 2001, 2002; Palloff & Pratt, 2001; Picciano, 2002; Rankin, 2002; Wang, Hinn, & Kanfer, 2001; Wegerif, 1998). A team at the Research Initiative for Teaching Effectiveness conducted a study and found a high correlation between interaction and learner satisfaction. This study was based on a large number of questionnaires ($N = 52,218$) collected over a 3-year period from learners enrolled in distance courses, mixed-mode courses, and traditional classroom courses. The team found that there was a statistically significant correlation between interaction and learner satisfaction in all three types of courses (Dziuban & Moskal).

In the distance learning setting, interaction becomes a more important factor as the focus shifts from instructor-centered to learner-centered learning, which emphasizes learners' responsibility for their own learning (Carr, 2000; Howell et al., 2003; McCombs, 2000; Miller, 2001; Moore, 1989, 2000). Moreover, distance learners have additional challenges to overcome because they are physically separated from the instructor and other learners. Anxiety related to new ways of learning and a feeling of isolation can be particular challenges for distance learners (Northrup, 2002). In addition to physical distance, the perceived psychological distance may impact course completion in distance learning (DeTure, 2004; Wolcott, 1996). A similar perception of distance is the transactional distance that is perceived by the learners when interacting in a mediated environment. Moore (1993) described transactional distance as "a psychological and communications space to be crossed or potential misunderstanding between the inputs of an instructor and those of the learner" (p. 22). Perceived distances exist in the traditional classroom, but physical distance increases psychological and transactional distances

because some form of technical media must be used to mediate the communication in online courses (Moore, 1993; Moore & Kearsley, 1996; Wolcott, 1996). Therefore, it is important to reduce these perceived distances in online learning with appropriate interaction to help learners develop a sense of learning community and persist with the online course until its completion (Palloff & Pratt, 2003).

Conceptual Frameworks of Interaction

As online learning becomes a significant part of higher education, many theoretical frameworks have been identified for online learning interaction (Hirumi, 2002). Moore's (1989) framework may be the most widely known of communication-based interactions: learner-content, learner-instructor, and learner-learner. Later, Hillman, Willis, and Gunawardena (1994) added learner-interface interaction to stress the importance of dealing with technology in the online learning environment. Since then, many conceptual frameworks of online interaction have been published and recognized based on these four types of interaction. Paulsen's (1995) four communication-based interactions (one-alone, one-one, one-many, and many-many), Hirumi's three levels of interaction (Level-I, Level-II, and Level-III), and Anderson's (2003) human and nonhuman levels of interaction are a few examples. Northrup (2001) proposed five interaction attributes that should be considered when developing and facilitating online courses. The five online interaction attributes are content interaction, conversation, collaboration, intrapersonal interaction, and performance support. In the following sections, the four types of interaction described by Moore and Hillman et al. and Northrup's five online interaction attributes are discussed in detail.

Learner-content interaction. According to Moore (1989), *learner-content interaction* refers to the learner's interaction with the content or subject of study. This type of interaction is the basic characteristic of education. Without it, there cannot be education because it is the process of intellectually interacting with the content that results in changes in the learner's understanding. Some learning programs are primarily learner-content interaction in nature, intended to help online learners in their study of the subject. Most forms of learner-content interaction can be presented asynchronously using multimedia such as audio, video, text, and graphics to meet the anytime and anyplace accessibility and flexibility for online learners (Anderson, 2002). However, Hirumi (2002) cautioned that some practical issues should be considered when designing learner-content interaction using multimedia: (a) whether plug-in and other software necessary to read multimedia formats is available to learners, (b) whether updating procedures are simple enough that most learners can do them with no or little help, or (c) whether the multimedia resource is reliable. If the multimedia that is used to access content information is not reliable, it may not be practical to continuously update the content files because it may further frustrate learners as they try to access the content.

Learner-instructor interaction. This type of interaction refers to the instructor's interaction with learners for the purpose of clarifying, elaborating, scaffolding, and providing feedback in regards to the content (Moore, 1989). Learner-instructor interaction is especially important when learners have no prior knowledge or attempt to apply new knowledge. Although self-directed learners may perform well when interacting with the content presented, they are vulnerable at the point of application because they may not know enough about the subject to be sure they are applying it

correctly (Anderson, 2003). Feedback can be used to inform learners of the accuracy of their response to instructional questions, to reinforce correct responses, and to change erroneous responses (Northrup, 2001). Feedback is particularly important in the online learning setting for closing the communication loop. Moreover, learners must perceive the message loop is complete; otherwise, their frustration will increase (Northrup & Rasmussen, 2000).

Researchers found that the learners' interaction with the instructor is a vital factor in relation to learner motivation and course satisfaction. Furst-Bowe (2001) investigated online learners' interaction experiences in comparison to traditional classroom experiences in three areas: (a) interaction with the instructor, (b) interaction with other learners, and (c) technical issues related to online coursework. The results indicated that interaction with the instructor was the most critical factor for learners' motivation and persistence. Specifically, positive and timely feedback was an important element in maintaining learners' motivation for continuing with the course (Furst-Bowe). In a study conducted at the State University of New York, Shea, Fredericksen, Pickett, and Pelz (2004) found that learner-instructor interaction influences learner motivation and satisfaction in significant ways. When the instructor in the study provided timely feedback, students reported enthusiasm for their online learning experience; without it, students reported frustration, even anger (Shea et al.)

Jiang and Ting (1999) conducted a study to find students' perceptions of important issues in learning at a distance. Data were collected from students enrolled in 78 courses offered through the State University of New York learning network ($N = 287$). Researchers found that students highly value supportive and timely feedback from their

instructor. They found a significant correlation between students' perceptions of successful learning and interaction with their instructor, suggesting the importance of learner-instructor interaction in the online learning environment (Jiang & Ting).

No matter how self-directed learners are, the instructor sets the tone for the course and, therefore, can influence learner persistence and outcome of the educational experience (Sciuto, 2002). The more powerful the technology becomes, the more indispensable instructors are. Technology may change some of the traditional roles for instructors, but it also requires instructors to engage in important roles that include using technology to find new ways to connect to the learners and to build a learning community beyond the school building (McCombs, 2000). Interaction with the instructor has the highest perceived value among online learners; the ability of instructors to keep the learners engaged in a virtual learning community is one of the key factors in low attrition in online courses (Anderson, 2003; Carr, 2000).

Learner-learner interaction. Moore's (1989) third type of interaction is the learner-learner interaction, which is the interaction between the learner and other learners, alone or in a group setting. Learner-learner interaction is designed to help learners and groups construct and apply targeted skills and knowledge. Developing a sense of learning community helps students to persist in the distance environment (Hirumi, 2002). If students have a sense of learning community, retention may increase because the feeling of isolation decreases (Palloff & Pratt, 2003). The desired level of learner-learner interaction is varied, depending on the learners' age, prior experience, and the level of learner autonomy. Furst-Bowe (2001) reported mixed results for interaction with other learners. Some learners indicated that they missed the face-to-face interaction with

classmates, whereas others reported that the online discussions were focused and interesting and that they may not have participated actively if they had been in a traditional classroom setting. Building a learning community may take longer online than in a face-to-face context, but it can be accelerated with required collaborative activities that mandate learners' working together. As learners work together and engage in learner-learner interaction, they develop a sense of learning community (Anderson, 2003).

Learner-interface interaction. Hillman et al. (1994) recognized the importance of interaction with technology and coined the term *learner-interface interaction*. This term refers to the interaction between the learner and the technology required for interacting with the content, instructor, and other learners. There has been a lack of consideration for the effects of technology interaction within online environments; however, researchers have found that the successful completion of an online course is often dependent upon the ease of use of the interface and learner familiarity with technology (Ehrlich, 2002; Palloff & Pratt, 2001). In addition, researchers found that the majority of participants expressed frustration in dealing with some types of technical problems at one time or another (Furst-Bowe, 2001; Northrup, 2002). Online learners have a significant challenge if they have to learn both technology and content at the same time (Schrum & Hong, 2002). Online learners must have a level of comfort with using the technology to access the content, to use e-mail, and to be able to participate in online discussions. Learners who do not possess the required skills to access learning materials and communicate with others spend much time learning how to interact with the technology. In addition to increasing frustration, the time spent on learning the technology affects learners' time to concentrate on intended learning.

All these different types of interaction should not be afterthoughts but must be designed intentionally into online education courses as essential parts of instructional strategies (Northrup, 2002). Interaction does not simply occur in online courses; rather, interaction must be carefully planned and sequenced as an integral part of online learning. To guide the design and selection of online interaction strategies, Northrup (2001) proposed five interaction attributes to be considered: (a) content interaction, (b) conversation, (c) collaboration, (d) intrapersonal interaction, and (e) performance support.

Content interaction. According to Northrup (2001), content interaction is the key component of an online course in which students learn new knowledge and skills. The content includes not only the topics and tasks for learners to learn but also instructional strategies to support the overall course goals and objectives. Depending on the learning goals, instructional content can be presented either through a learner-centered approach or instructor-centered approach. A learner-centered approach is more appropriate when the learning outcomes of instruction are to analyze, synthesize, evaluate, or solve ill-defined problems. This approach requires greater responsibility for students in their learning. On the other hand, an instructor-centered approach is more appropriate when instruction is procedural or declarative in nature. Content can be presented in a lecture form through text, video, audio, or graphic presentations. Presented content provides the foundation for other interactions (Northrup). Without the bases of content interaction, other interactions are likely to result in interaction more typical of a social chat than a quality educational experience (Anderson, 2003).

Conversation interaction. Much of learning takes place within a social context, a process of mutual construction of understanding through conversation with others

(Northrup, 2001). Conversation offers the opportunity for learners to clarify or elaborate on the subject of study and gain the motivational support of fellow learners as well as the instructor. With online communication, it is important for the learners to know the goals of online discussion; otherwise, they may not gain the learning experiences as intended. Asynchronous communication tools, such as threaded discussion or message boards, are effective technologies to promote conversation because learners can post a question or response to a topic that is then viewable by all learners. In addition, asynchronous communication has the benefit of allowing people to think about their responses and to consider those of others in more organized ways (Ehrlich, 2002). Hillman et al. (1994) found that the use of asynchronous communication helps students who are typically anxious about face-to-face encounters. Students who are less socially interactive in a traditional classroom tend to communicate more readily in online courses (Shea et al., 2004). Hubschman (1999) also found that introverted students replied to e-mail significantly more often than did extraverted students. It seems that an online course allows a more equitable distribution of attention between instructors and students to the point where less socially able students become more active participants. This increased interaction may have a positive effect on the learning outcomes of those less socially able students.

Collaboration interaction. *Collaboration* refers to a strategy for promoting group interactions (Northrup, 2001). The rich educational value of collaborative learning was not available to learners involved in the first generation of distance learning study. Distance learning's rich tradition of independent study has been expanded to include many types of collaborative learning opportunities through the use of a variety of

synchronous and asynchronous technology (Anderson, 2003; Taylor, 1995).

Collaborative learning involves groups of students participating actively in online discussion, debates, case studies, small group projects, or other learning activities (Northrup; Olgren, 2000).

Northrup (2001) cautioned, however, that a group does not automatically become collaborative just because individuals are assigned to a group. Carefully designed and facilitated collaborative group work is necessary to promote interaction among students. Building a community is considered critical to the online learning environment; but in many online course designs, interaction and collaboration remain an add-on feature rather than an integral part of course design (Gunawardena, 2004). Strategies to promote online collaborative interaction involve many of the same issues that exist for a face-to-face collaborative group interaction, such as learner differences, the size of the group, the group goals and assignments, individual roles and responsibilities, and a shared grade. Collaboration not only promotes a supportive learning community but also provides opportunities for online learners to work together to accomplish common goals. The ability to work together and accomplish shared goals is one of the essential proficiencies needed in a professional environment; whether involved in a profit or nonprofit organization, individuals must be able to work together in achieving organizational goals (Anderson, 2002). Initially, collaboration was considered a separate interaction attribute (Northrup), but later it was combined with the conversation interaction attribute (Northrup, 2002).

Intrapersonal interaction. *Intrapersonal interaction* refers to the cognitive processes that individuals need to monitor and regulate their learning (Northrup, 2001).

Successful online learners tend to possess an internal locus of control and are self-directed in achieving their goals (Picciano, 2001). Monitoring one's own learning progress is particularly important in online learning since learners are physically separated from the instructor and other learners and are working independently. For learning to occur, the learner must interact with and process the content of the course. The content cannot just pass before one's senses but must be cognitively processed. Through intrapersonal interaction, learners take what is learned at the personal level, integrate it with existing experiences, and organize it into meaning (Berge, 1999). Intrapersonal interaction is an important skill for online learners to achieve success, yet this element of online course design is often neglected. Therefore, it is important to embed many cognitive strategies within online courses, along with helpful tips and ideas for time management and independent learning (Northrup). A synopsis of lesson, a note-taking guide, a summary of each lesson, and a nongraded self-quiz that provides immediate feedback are good examples of cognitive strategies that could be embedded within the context of online courses.

Performance support. Online learners need support throughout the course; without adequate support, the course retention will suffer (Northrup, 2001). Performance support is described as an electronic system that is structured to provide immediate online access to the information and assistance to help individuals to perform a task with the minimum support and intervention by others (Gery, 1991). Instructional, motivational, and administrative support can be provided to online learners at the right time with an electronic performance support system (EPSS). Instructional support promotes online learners' interaction with the content, providing effective ways to learn new information

and knowledge presented. After a major section, for example, learners can be prompted to take a nongraded quiz that provides immediate feedback to affirm or correct what they have learned. Technical support can be provided using tutorial programs that the learners can access at their convenience. Anxiety related to the different nature of online communication and technical difficulties can be barriers to active participation and interaction (Palloff & Pratt, 1999). Learners can be encouraged to complete a tutorial program on using the technology, gaining skills necessary to participate in an online course. Motivational support of the course is also important and must be considered when an online course is designed and presented (Northrup). Use of a “cyber snack”—for example, a humorous cartoon—could be a strategy for providing motivational support (Draves, 1999).

In addition, other support, such as help in completing financial aid applications, basic student services, academic advising, library service, and help desk services, need to be considered when delivering online programs (Picciano, 2001). As online support has become more complex with instructional as well as administrative supports, more educational institutions have adopted an integrated system to provide streamlined support for online learners (Chapman & Hall, 2001). For example, a learning management system can be used to manage the entire online learning program from start to finish; it begins with an online registration and tuition payment process, continues through the course content delivery, manages the learners’ progress and performance through formative and summative evaluations, provides resource supports such as library services or tutorial programs for technology, and ends with reporting a grade and awarding course credits (Buell & Clayton, 2003; Chapman & Hall).

Section Summary

As discussed in this section, there are a number of different frameworks for interaction that could be used in developing and facilitating online courses. Physical distance creates unintended psychological and transactional distance for online learners. Use of appropriate interactions that are carefully considered from the learners' perspectives decreases this perceived distance. Interaction plays a key role in determining the course quality and satisfaction that influence learner persistence, thus directly impacting retention rates (Berge, 1999; Northrup, 2002; Tillman, 2002).

Chapter Summary

Three major areas that are related to this study were reviewed in this chapter. The first section focused on the topic of distance learning. The topics included a historical perspective of distance learning, its rapid growth, the effectiveness of distance learning, and the critical issue of attrition. The second section focused on adult learners and adult learning theories. Since most distance learners are adult learners, it is important to know the characteristics of adult learners and how they learn. The last section was dedicated to interaction-related topics, including the importance of interaction in distance learning, with supporting studies and a review of the conceptual frameworks of online interaction.

CHAPTER III

METHOD

Introduction

The primary purpose of this study was to investigate students' perceptions of online learning interaction and to explore the difference between undergraduate and graduate online learners' perceptions. The second goal of this study was to explore the reasons students choose to learn online. This chapter provides the relevant issues and procedures for the study. It begins with a description of the research design, independent and dependent variables, participants, and instrument. Also, this chapter includes detailed descriptions of the procedures for collecting and analyzing data and ends with the limitations of the study.

Research Design

A survey research method was used for this study. The survey method was an appropriate research method for this study because the primary focus of this study was to investigate students' perceptions of online interaction. According to Creswell (2002), survey research design is most suitable to assess characteristics of a population or to learn about individuals' perceptions, attitudes, and opinions. Also, a nonprobability sampling method was used for this study. A nonprobability sampling method is widely used in educational research because probability sampling is not always possible in educational

research; researchers select participants based on availability, convenience, and characteristics the researchers seek to study (Salinas, 2002). Although there are limitations with study results because of use of a nonprobability sampling method, the sample can provide useful information for answering research questions. This study was a replication and expansion of Northrup's study (2002). Replicating studies, which is a common practice in research in which studies are repeated using different groups and settings, provides some basis for generalizing findings broadly (Creswell, 2002).

Research Questions

The purpose of this study was to investigate students' perceptions of online learning interaction and to examine a possible difference between undergraduate and graduate students' perceptions. In addition, the reasons students choose to learn online were explored. Three specific research questions were investigated in this study:

1. How do students perceive interaction in online learning?
2. What are the differences between undergraduate and graduate students' perceptions of online interaction?
3. Why do students choose to take online courses?

Independent and Dependent Variables

An independent variable is a characteristic that is independent of the dependent variable but may influence the dependent variable, whereas a dependent variable is a quality that may be influenced by the independent variable (Creswell, 2002). Unlike experimental research design, in which a treatment variable is often used as an independent variable, survey research design usually involves a measured variable as the

independent variable. A measured variable is an independent variable that is measured, not manipulated, by the researcher (Creswell).

The measured independent variable in this study was group affiliation (undergraduate or graduate). The dependent variable in this study was students' perceptions of interaction, specifically the four interaction attributes measured by the use of the Online Learning Interaction Inventory (Northrup, 2002). The four interaction attributes are (a) content interaction, (b) conversation and collaboration interaction, (c) intrapersonal/metacognitive interaction, and (d) support interaction.

Participants

The participants were selected among online students at the University of West Florida (UWF), located in Pensacola, Florida. As a member of the state university system of Florida, UWF serves the region and the state. The total number of enrollment in Fall 2006 was 9,655, including 8,417 at the undergraduate level and 1,238 at the graduate level (UWF, 2007). The target population for this study consisted of students enrolled in education-related undergraduate and graduate online courses in Spring 2007. The total number of education-related online course enrollment was 649, including 377 undergraduate and 272 graduate students. Most of these students were enrolled in degree programs in the Division of Teacher Education, Department of Engineering and Computer Technology, or Department of Professional and Community Leadership. A total of 237 online students (130 undergraduate and 107 graduate) were invited to participate in the study, and 94 students (42 undergraduate and 52 graduate) participated in the study.

Instrumentation

To investigate students' perceptions of online interaction, the Online Learning Interaction Inventory (OLII) was used. The OLII has a reliability coefficient of .95 and was specifically developed to measure online students' perspectives on four interaction attributes: (a) the level of interaction with content, (b) types of conversation and collaboration, (c) the level of intrapersonal/metacognitive interaction, and (d) the need for support (Northrup, 2002). Initially, the conversation and collaboration interaction attributes were considered separate attributes (Northrup, 2001), but they were combined in a later study (Northrup, 2002). To create the instrument, Northrup (2002) aligned literature findings to online delivery strategies. She then validated items through a series of pilot studies and expert review.

The OLII is a self-reporting questionnaire in which participants are asked to complete six sections for a total of 50 items. Although most items were written as positive indications, some items were written as negative indications. The reason for writing items in both positive and negative indications was to counteract the tendency for a respondent to automatically and unthinkingly give the same answer to all questions. The first section contains demographic information questions, and the second section has questions concerning reasons for taking an online course. The following four sections of the OLII address the four attributes of interaction. The questions in these four sections are answered on a 5-point Likert scale of (a) 1 = *strongly disagree*; (b) 2 = *disagree*; (c) 3 = *not sure*; (d) 4 = *agree*; and (e) 5 = *strongly agree*. Section 3 consists of 13 items relating to the indicators of content interaction; Section 4 has 14 items relating to the indicators of conversation and collaboration interaction; Section 5 contains 7 items relating to the

indicators of intrapersonal/metacognitive interaction; and Section 6 includes 7 items relating to the indicators of need for support interaction (Northrup, 2002).

Procedures

Approval to conduct the study was obtained from the UWF Institutional Review Board (IRB) for Human Research Participant Protection (Appendix A) and from the instructors. The permission to use the OLII was obtained from Dr. Northrup. Approximately 6 weeks from the end of the Spring 2007 semester, an invitational e-mail (Appendix B) was sent to students enrolled in selected undergraduate and graduate online courses, including the link to the Web survey site. Waiting until close to the end of the semester was intentional. The participants had sufficient time to develop perspectives of their knowledge of the courses and time to reflect on the interaction aspects of online learning. The e-mail explained the purpose of the study, described the procedure, and provided a brief description of the instrument. As participants entered the survey Web site, a consent statement was provided informing them that participation was voluntary and reminding them that information provided would be treated as confidential. They were asked to consent if they chose to participate in the study. Upon their consent, they were given access to the survey instrument (Appendix C). The collected data were then imported to the Statistical Package for the Social Sciences (SPSS) for the analyzing process.

Data Analysis

To answer research questions, descriptive statistics were used to report the findings. Descriptive statistics, including frequencies, means, standard deviations, and

percentages, are commonly used in survey research to describe findings (Fink & Kosecoff, 1998). In addition, an independent-measures *t* test was used to test the difference between the perceptions of undergraduate and graduate online students. The independent-measures *t* test is an appropriate statistical test to determine whether or not there is a significant difference between two variables, and it is also an appropriate test when the independent variable is nominal scale and the dependent variable is interval scale (Creswell, 2002; Gravetter & Wallnau, 2000). The assumptions for use of the independent-measures *t* test are that the scores on the dependent variable (a) are normally distributed in each of the two populations, (b) have equal variance of population, and (c) are collected from independent groups (Gravetter & Wallnau). The assumptions for the independent-measures *t* test were met for this study.

Limitations and Assumptions

The study was focused on the perceptions of interaction in two groups, undergraduate and graduate online students; therefore, the effects of different instructors and content were not differentiated in this study. Next, the method of convenience sampling was a valid method and widely used in educational research; however, a study using convenience sampling should not be overgeneralized because the participants have not been randomly selected. Lastly, this study used a survey research method, which involved use of a self-reporting questionnaire. An assumption was, therefore, that the participants answered the survey questions truthfully and accurately.

Chapter Summary

This chapter restated the purpose of the study and described the overall procedures of the study. It provided the research design and detailed descriptions of the participants, instrument, and variables. The chapter ended with a discussion of the types of statistical tests and the limitations of the study.

CHAPTER IV

RESULTS

Introduction

The purpose of this study was to investigate students' perceptions of online learning interaction and to examine if there is a significant difference between undergraduate and graduate students' perceptions of interaction. In addition, the reasons students choose to learn online were investigated. Students were selected using a convenience sampling method from a target population, which consisted of students enrolled in education-related undergraduate and graduate online courses during the Spring semester of 2007 at the University of West Florida. Two weeks prior to the final exam week, a total of 237 online students (130 undergraduate and 107 graduate) were invited to participate in the study. The invitational e-mail contained a brief description of the purpose of the study, the importance of their contribution, and the link to the survey site. Students were offered the opportunity to enter a drawing for a bookstore gift certificate to encourage participation as well as show appreciation for their time. One week later, a reminder e-mail was sent to the potential participants to encourage their participation. After two weeks, a total of 98 responses were completed, which reflected an overall response rate of 41%. Four of the 98 surveys were considered not usable. Therefore, a total of 94 surveys were used in the analysis; the useable response rate for

the study was 40%, which is an acceptable response rate for survey research (Waide, 2004).

Participants' demographic information and the results of data analysis for research questions are included in this chapter. To answer the first research question—How do students perceive interaction in online learning?—descriptive statistics and frequency tables were used to summarize the responses of undergraduate and graduate students. To answer the second research question—What are the differences between undergraduate and graduate students' perceptions of online interaction?—a *t* test was used to compare the two groups. To answer the third research question—Why do students choose to take online courses?—descriptive statistics and frequency tables were used to summarize the results.

Participants and Demographics

In this section, the participants' demographic information is presented, using percentage distributions. Participants included both undergraduate and graduate online students. Forty-two undergraduate students and 52 graduate students participated in this study.

Undergraduate Students

One hundred thirty undergraduate online students were invited to participate in this study, and 42 students completed the Online Learning Interaction Inventory (OLII); the response rate was 32% for undergraduate students. Eight (19%) of undergraduate respondents were male, and 34 (81%) were female. Sixteen undergraduate respondents (38%) were from the under-25 age group; 10 respondents (24%) were in the 26 to 35 age

range; 11 respondents (26%) were in the 36 to 50 age range; and 5 respondents (12%) were over 50. Thirty-six (86%) undergraduate respondents were Caucasian; 1 (2%) respondent was African-American; 2 (5%) respondents were Hispanic; 2 (5%) respondents were American Indian/Alaskan Native; and 1 (2%) respondent was Asian/Pacific Islander.

Graduate Students

Of the 107 graduate online students invited to participate in the study, 52 students completed the OLII; the response rate was 49% for graduate students. Twelve (23%) of the graduate respondents were male and 40 (77%) were female. Ten (19%) graduate respondents were from the under-25 age group; 16 (31%) respondents were in the 26 to 35 age range; 19 (37%) respondents were in the 36 to 50 age range; and 7 (14%) respondents were over 50. Forty-three (83%) graduate respondents were Caucasian; 8 (15%) respondents were African-American; and 1 (2%) respondent was Asian/Pacific Islander.

Data Analysis for Research Questions

Three research questions were investigated in this study:

1. How do students perceive interaction in online learning?
2. What are the differences between undergraduate and graduate students' perceptions of online interaction?
3. Why do students choose to take online courses?

In this section, the results of the data analysis related to the three research questions is presented.

Research Question 1

The first research question was “How do students perceive interaction in online learning?” The question was answered by using the OLII to measure the four interaction attributes. Most items were written as a positive indication; however, some items were written as a negative indication to counteract the tendency for a respondent to automatically give the same answer to all items. These items were recoded prior to data analysis. Items were measured using a 5-point Likert scale: (a) 1 = *strongly disagree*; (b) 2 = *disagree*; (c) 3 = *not sure*; (d) 4 = *agree*; and (e) 5 = *strongly agree*. Therefore, the possible range of the mean score for each interaction attribute was from 1 to 5. The results of students’ perceptions of the content, conversation and collaboration, intrapersonal/metacognitive, and support interactions are presented separately for undergraduate and graduate students.

Undergraduate students. In Table 1, undergraduate students’ perceptions of content interaction are displayed. There were 13 items associated with content interaction. The means and standard deviations of these items are listed in Table 1. In Table 2, undergraduate students’ perceptions of conversation and collaboration interaction are displayed. There were 14 items to assess conversation and collaboration interaction. Among the 14 items, the majority of undergraduate students strongly agreed that feedback from the instructor was very important for their online learning experiences. The means and standard deviations of these items are displayed in Table 2.

Table 1

Means and Standard Deviations of the Content Interaction Items Reported by Undergraduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
14. It is frustrating when there are too many interactive assignments in a week.	4.00	1.01
25. Interaction should vary based upon the learning outcome.	3.79	0.72
42. I like posing questions to experts (recoded).	3.67	0.95
19. I like courses that are partially individually with some instructor direction.	3.52	1.09
50. I learn well from online text (recoded).	3.50	0.89
13. I enjoy courses with a lot of structure, everyone moving at the same pace.	3.31	1.16
49. I learn well from audio-narrated PowerPoint presentations.	3.24	0.98
30. I like to debate ideas with my peers online.	3.19	1.07
36. I enjoy readings followed by online discussion (recoded).	3.00	1.08
24. I like to participate in case studies online.	2.95	0.96
32. I enjoy participating in structured games.	2.93	1.07
8. I enjoy courses that are completely individualized/no structure.	2.76	1.32
43. I learn best through textbook readings.	2.12	1.09

Note. $n = 42$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

Table 2

Means and Standard Deviations of the Conversation and Collaboration Interaction Items Reported by Undergraduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
52. Getting feedback from instructors is important to me (recoded).	4.38	0.94
31. Working in teams for projects is hard for me.	3.71	1.26
20. Feedback from the instructor should occur at least two times a week.	3.62	1.01
48. I enjoy discussing ideas and concepts with peers.	3.57	0.94
33. I like to keep the same team for the entire semester.	3.29	0.94
21. I like to share information with my peers.	3.22	0.94
10. It is important to get to know my peers online.	3.21	0.98
51. It is important to me to get feedback from my peers.	3.21	1.00
15. I see why it is necessary to build a community of learners in an online environment (recoded).	3.17	1.03
38. It is important to be available to tutor my peers.	3.05	0.88
44. I enjoy serving as a guest presenter in class.	2.71	0.84
27. I think that forming a study-buddy group is necessary (recoded).	2.38	0.99
37. I require daily feedback from my instructor (recoded).	2.33	1.62
9. I like participating when I feel like I am doing busywork (recoded).	2.14	0.98

Note. $n = 42$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

In Table 3, undergraduate students' perceptions of intrapersonal/metacognitive interaction items are displayed. There were seven items on the OLII to assess intrapersonal/metacognitive interaction. The majority of undergraduate students strongly agreed that it was important to monitor their own progress each week, and the least number agreed that they needed an instructor to encourage them to log on several times throughout the week. The means and standard deviations for the seven items measuring intrapersonal/metacognitive interaction are listed in Table 3.

Table 3

Means and Standard Deviations of the Intrapersonal/Metacognitive Interaction Items Reported by Undergraduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
11. It is important to monitor my own progress each week.	4.24	0.82
16. Having structured times that assignments are due is important.	3.98	1.16
45. Including note-taking guides to accompany PowerPoint presentations is helpful to me.	3.48	1.07
34. Preparing an advance organizer each week helps me organize my thoughts.	3.40	1.21
22. Having posted times for chat sessions is important.	3.07	0.95
39. Providing a graphical flowchart of the steps I should take in completing the lesson is necessary for me (recoded).	2.40	0.80
28. I need an instructor to encourage me to log on several times throughout the week (recoded).	2.05	1.06

Note. $n = 42$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

In Table 4, undergraduate students' perceptions of support interaction are displayed. There were seven items that were used to assess support interaction. The majority of undergraduate students strongly agreed that timely response from an instructor was very important to them. A fewer number of undergraduate students reported that they needed tutorials or assistance in using technology tools. The means and standard deviations of these items are indicated in Table 4.

Table 4

Means and Standard Deviations of the Support Interaction Items Reported by Undergraduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
12. It is important to me for an instructor to be very timely in his/her responses back to me.	4.67	0.72
46. It is extremely frustrating when the technology doesn't perform as the directions say that it should.	4.29	1.00
40. Getting in touch with my instructor is necessary for my ongoing success in the course.	4.14	1.00
35. I am very frustrated when I am confused about assignments.	4.05	1.06
29. Tips from my peers are extremely valuable.	3.88	0.89
17. I require the assistance of a mentor to guide me through clarification of technical and confusing information (recoded).	3.05	1.04
23. I need tutorials (at least access to them) to assist me in using chat rooms, threaded discussions, etc.	2.50	1.17

Note. $n = 42$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

Graduate students. In Table 5, graduate students' perceptions of content interaction are displayed. There were 13 items associated with content interaction. The majority of graduate students reported that they preferred partially individualized courses with some instructor direction. The means and standard deviations of these items are indicated in the table.

In Table 6, graduate students' perceptions of conversation and collaboration interaction are displayed. There were 14 items to assess the conversation and collaboration interaction attribute. Graduate students strongly agreed that feedback from the instructor was highly important for their online learning experiences. The means and standard deviations of these items are displayed in the table.

Table 5

Means and Standard Deviations of the Content Interaction Items Reported by Graduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
19. I like courses that are partially individualized with some instructor direction.	4.12	0.68
25. Interaction should vary based upon the learning outcome.	3.90	0.69
14. It is frustrating when there are too many interactive assignments in a week.	3.88	0.92
50. I learn well from online text (recoded).	3.56	0.87
13. I enjoy courses with a lot of structure, everyone moving at the same pace.	3.56	1.04
42. I like posing questions to experts (recoded).	3.56	1.04

(Table 5 continues)

(Table 5 continued)

Item	M	SD
36. I enjoy readings followed by online discussion (recoded).	3.40	1.02
49. I learn well from audio-narrated PowerPoint presentations.	3.37	0.89
24. I like to participate in case studies online.	3.17	0.90
32. I enjoy participating in structured games.	3.17	0.94
30. I like to debate ideas with my peers online.	3.17	1.26
8. I enjoy courses that are completely individualized/no structure.	3.02	1.15
43. I learn best through textbook readings.	2.67	0.96

Note. $n = 52$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

Table 6

Means and Standard Deviations of the Conversation and Collaboration Interaction Items Reported by Graduate Students in Decreasing Rank Order

Item	M	SD
52. Getting feedback from instructors is important to me (recoded).	4.56	0.78
48. I enjoy discussing ideas and concepts with peers.	3.81	0.95
21. I like to share information with my peers.	3.58	0.94
15. I see why it is necessary to build a community of learners in an online environment (recoded).	3.54	1.08
31. Working in teams for projects is hard for me.	3.44	1.32
33. I like to keep the same team for the entire semester.	3.38	0.91

(Table 6 continues)

(Table 6 continued)

Item	<i>M</i>	<i>SD</i>
20. Feedback from the instructor should occur at least two times a week.	3.31	1.06
10. It is important to get to know my peers online.	3.23	1.02
38. It is important to be available to tutor my peers.	2.92	0.99
51. It is important to me to get feedback from my peers.	2.90	1.19
44. I enjoy serving as a guest presenter in class.	2.71	1.05
27. I think that forming a study-buddy group is necessary (recoded).	2.62	1.12
37. I require daily feedback from my instructor (recoded).	2.02	1.00
9. I like participating when I feel like I am doing busywork (recoded).	1.88	1.02

Note. $n = 52$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

In Table 7, graduate students' perceptions of intrapersonal/metacognitive interaction are displayed. There were seven items on the OLII to assess the intrapersonal/metacognitive interaction attribute. The majority of graduate students strongly agreed that monitoring one's own progress each week and having structured time for assignments were important in online learning, and the least number agreed that they needed encouragement from their instructor to log on several times throughout the week. The means and standard deviations for the seven items measuring intrapersonal/metacognitive interaction are displayed in Table 7.

Table 7

Means and Standard Deviations of the Intrapersonal/Metacognitive Interaction Items Reported by Graduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
11. It is important to monitor my own progress each week.	4.65	0.52
16. Having structured times that assignments are due is important.	4.35	0.86
45. Including note-taking guides to accompany PowerPoint presentations is helpful to me.	3.58	1.02
34. Preparing an advance organizer each week helps me organize my thoughts.	3.40	1.26
22. Having posted times for chat sessions is important.	2.81	1.12
39. Providing a graphical flowchart of the steps I should take in completing the lesson is necessary for me (recoded).	2.56	1.11
28. I need an instructor to encourage me to log on several times throughout the week (recoded).	1.85	0.85

Note. $n = 52$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

In Table 8, graduate students' perceptions of support interaction items are displayed. There were seven items that were used to assess support interaction. The majority of graduate students strongly agreed that timely response from an instructor was very important to them. A fewer number of graduate students reported that they needed tutorials or assistance in using technology. The means and standard deviations of these items are indicated in Table 8.

Table 8

Means and Standard Deviations of the Support Interaction Items Reported by Graduate Students in Decreasing Rank Order

Item	<i>M</i>	<i>SD</i>
12. It is important to me for an instructor to be very timely in his/her responses back to me.	4.56	0.61
46. It is extremely frustrating when the technology doesn't perform as the directions say that it should.	4.44	0.50
35. I am very frustrated when I am confused about assignments.	4.15	0.96
40. Getting in touch with my instructor is necessary for my ongoing success in the course	3.90	0.96
29. Tips from my peers are extremely valuable.	3.77	0.85
17. I require the assistance of a mentor to guide me through clarification of technical and confusing information (recoded).	2.92	1.25
23. I need tutorials (at least access to them) to assist me in using chat rooms, threaded discussions, etc.	2.71	1.35

Note. $n = 52$. *Recoded* indicates conversion from negative to positive indication. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

Research Question 2

The second research question was “What are the differences between undergraduate and graduate students’ perceptions of online interaction?” The results are summarized in the following subsections for undergraduate students, graduate students, and a comparison of undergraduate and graduate students.

Undergraduate students. Table 9 displays the means and standard deviations of undergraduate students' perceptions of interaction attributes in an online learning environment. The content interaction attribute was measured by 13 items that addressed the level of the structure and pacing, as well as the level of interactive-strategy used in an online course. Undergraduate students reported that interaction should vary based upon the learning outcome ($M = 3.79$, $SD = .72$), but was frustrating when there were too many interactive assignments in a week ($M = 4.00$, $SD = 1.01$). They believed that they learn better through innovative interaction strategies such as audio-narrated presentations ($M = 3.24$, $SD = .98$) than from textbook readings ($M = 2.12$, $SD = 1.08$). Undergraduate students enjoyed courses that are partially individualized, with some instructor direction ($M = 3.52$, $SD = 1.09$) and courses with a lot of structure and everyone moving at the same pace ($M = 3.31$, $SD = 1.16$).

Table 9

Means and Standard Deviations of Interaction Attributes Reported by Undergraduate Students in Decreasing Rank Order

Measures	<i>M</i>	<i>SD</i>
Content interaction (13 items)	3.22	0.30
Conversation and collaboration (14 items)	3.16	0.40
Intrapersonal/metacognitive (7 items)	3.23	0.50
Support (7 items)	3.79	0.55

Note. $n = 42$. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

The conversation and collaboration attribute was measured by 14 items that focused on feedback, discussion, and participation in a learning community. The majority of undergraduate students agreed that getting feedback from instructors is important ($M = 4.38$, $SD = .94$); however, they did not require daily feedback from their instructors ($M = 2.33$, $SD = 1.16$). Undergraduate students reported that it is important to get to know peers online ($M = 3.21$, $SD = .98$), to share information with peers ($M = 3.55$, $SD = .94$), and to discuss ideas and concepts with peers online ($M = 3.57$, $SD = .94$).

The intrapersonal/metacognitive attribute was measured by seven items that focused on students' monitoring their own progress and receiving encouragement and guidance from instructors. Most undergraduate students reported that having structured times to complete assignments ($M = 3.98$, $SD = 1.16$) and monitoring their own progress each week ($M = 4.24$, $SD = .82$) were important factors. They did not require instructors' encouragement several times in a week ($M = 2.05$, $SD = 1.06$), and they valued cognitive tools such as note-taking guides ($M = 3.48$, $SD = 1.07$) and an advance organizer ($M = 3.40$, $SD = 1.21$).

The support interaction attribute was measured by seven items that addressed mentoring, tutorials, and timeliness of response. Most undergraduate students strongly agreed that receiving timely responses from instructors was important ($M = 4.67$, $SD = .72$), and being able to get in touch with their instructor influenced their ongoing success in the course ($M = 4.14$, $SD = 1.00$). They also acknowledged that tips from peers were extremely valuable ($M = 3.88$, $SD = .89$). In terms of technology support, undergraduate students expressed little need of tutorials in using technology ($M = 2.50$, $SD = 1.14$).

Graduate students. Table 10 displays the means and standard deviations of graduate students' perceptions of interaction attributes. For content interaction, most graduate students agreed that interaction should vary based upon the learning outcome ($M = 3.90$, $SD = .69$), but it was frustrating when there were too many interactive assignments in a week ($M = 3.88$, $SD = .92$). They believed that they learn better through innovative interaction strategies such as audio-narrated presentations ($M = 3.37$, $SD = .89$) than from textbook readings ($M = 2.67$, $SD = .96$). Graduate students enjoyed courses that are partially individualized, with some instructor direction ($M = 4.12$, $SD = .68$), and courses with a lot of structure and everyone moving at the same pace ($M = 3.56$, $SD = 1.04$).

Table 10

Means and Standard Deviations of Interaction Attributes Reported by Graduate Students in Decreasing Rank Order

Measures	M	SD
Content interaction (13 items)	3.47	0.33
Conversation and collaboration (14 items)	3.14	0.48
Intrapersonal/metacognitive (7 items)	3.31	0.50
Support (7 items)	3.78	0.56

Note. $n = 52$. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; and 5 = *strongly agree*.

As for the conversation and collaboration interaction items, most graduate students agreed that getting feedback from instructors was important ($M = 4.56$, $SD = .78$), but a majority of them did not require daily feedback from their instructors ($M =$

2.02, $SD = 1.00$). Graduate students reported that it was important to get to know peers online ($M = 3.23$, $SD = 1.02$), to share information with peers ($M = 3.58$, $SD = .94$), and to discuss ideas and concepts with peers online ($M = 3.81$, $SD = .95$).

In terms of intrapersonal/metacognitive interaction, the majority of graduate students reported that having structured times to complete assignments ($M = 4.35$, $SD = .86$) and monitoring their own progress each week ($M = 4.65$, $SD = .52$) were crucial. They did not require instructors' encouragement several times in a week ($M = 1.85$, $SD = .85$). Also, graduate students valued cognitive tools such as note-taking guides ($M = 3.58$, $SD = 1.02$) and an advance organizer ($M = 3.40$, $SD = 1.26$).

For the support interaction attribute, the majority of graduate students agreed that receiving timely responses from instructors was important ($M = 4.56$, $SD = .61$), and being able to get in touch with their instructor influenced their ongoing success in the course ($M = 3.90$, $SD = .98$). They valued tips from peers ($M = 3.77$, $SD = .85$) and did not need tutorials in using chat rooms or threaded discussions ($M = 2.71$, $SD = 1.35$).

Comparison of students. A comparison between undergraduate and graduate students' perceptions of online interaction attributes was made. The independent-measures t test was used to test a possible significant difference between the perceptions of undergraduate and graduate online students. Before proceeding to the test, assumptions for t test were explored and met, including the homogeneity of variance test. The Levene's Homogeneity of Variance Test was conducted to assess whether the assumption of equality of variances were met. This was an essential step because violating the assumption can negate any meaningful interpretation of the t test results. There were no violations of the assumptions.

The results for the content interaction attribute are presented in Table 11.

Undergraduate students ($M = 3.23$, $SD = .30$) reported content interaction lower than graduate students ($M = 3.43$, $SD = .33$). The difference was statistically significant at the .05 level, $t(92) = -3.01$, $p = .05$, indicating that undergraduate and graduate students view content interaction differently. A higher number of graduate students agreed or strongly agreed that they enjoyed participating in structured online learning games. Also more graduate students reported that they liked courses that were partially individualized, with some instructor direction and everyone moving at the same pace.

Table 11

t Test for Difference in Means and Standard Deviations for Content Interaction reported by Undergraduate and Graduate Students

Students	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Undergraduate	42	3.23	0.30	-3.01*
Graduate	52	3.43	0.33	

* $p < .05$.

The means for conversation and collaboration attribute indicated that there was a slight difference between undergraduate students ($M = 3.16$, $SD = .40$) and graduate students ($M = 3.13$, $SD = .48$); however, this difference was not statistically significant. The means for the intrapersonal/metacognitive attribute indicated that there was a difference between undergraduate ($M = 3.23$, $SD = .50$) and graduate students ($M = 3.31$, $SD = .50$), but this difference was not statistically significant. In terms of the support interaction attribute, the means were similar between undergraduate ($M = 3.80$, $SD = .55$)

and graduate students ($M = 3.78$, $SD = .56$). The t test of differences between undergraduate and graduate online students' perceptions of the support interaction attribute did not indicate a significant difference.

In summary, most students perceived interaction as an important factor for their online learning experiences. There was a significant difference between undergraduate and graduate students' perceptions of content interaction. However, no significant differences were found between undergraduate and graduate students' views of conversation and collaboration, intrapersonal/metacognitive, and support interactions.

Research Question 3

The results of Research Question 3—Why do students choose to take online courses?—are presented in Table 12 using the means and standard deviation. In addition, the independent-measures t test was used to test possible differences between undergraduate and graduate students' reasons for taking online courses.

The majority of both groups of students reported that they enjoyed the flexibility of online courses; however, undergraduate students ($M = 4.38$, $SD = 1.08$) reported lower than graduate students ($M = 4.77$, $SD = .47$), and the difference was statistically significant at the .05 level, $t(92) = -2.33$, $p = .022$. This finding, which is summarized in Table 13, suggested that more graduate students value the flexibility of online courses than do undergraduate students. There were no significant differences between the undergraduate and graduate students' responses to the other reasons students choose to take online courses.

Table 12

Means and Standard Deviations of Reasons for Taking Online Courses Reported by Undergraduate and Graduate Students

Statement	Group			
	Undergraduate		Graduate	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Enjoy the flexibility of online courses	4.38	1.08	4.77	0.47
Take online courses for convenience	3.76	1.64	4.17	1.34
Could not attend school if courses were not online	3.48	1.45	3.35	1.51
Prefer taking campus-based courses to online courses	2.40	1.36	2.35	1.25

Note. Undergraduate $n = 42$, and graduate $n = 52$. Items were measured using a 5-point Likert scale: 1 = *strongly disagree*; 2 = *disagree*; 3 = *not sure*; 4 = *agree*; 5 = *strongly agree*.

Table 13

t Test for Difference of Means and Standard Deviations for Enjoying the Flexibility of Online Courses Reported by Undergraduate and Graduate Students

Students	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Undergraduate	42	4.38	1.08	-2.33*
Graduate	52	4.77	.47	

* $p < .05$.

Students were also asked how many online courses they have taken. Figure 1 presents this comparison in percentages between undergraduate and graduate students' number of online courses taken. A majority of students responded that they have taken

two or more online courses. A higher percentage of undergraduate students than graduate students reported that they have taken five to eight online courses, with a difference of 11.2%; however, more graduate students reported that they have taken online courses in the rest of the categories.

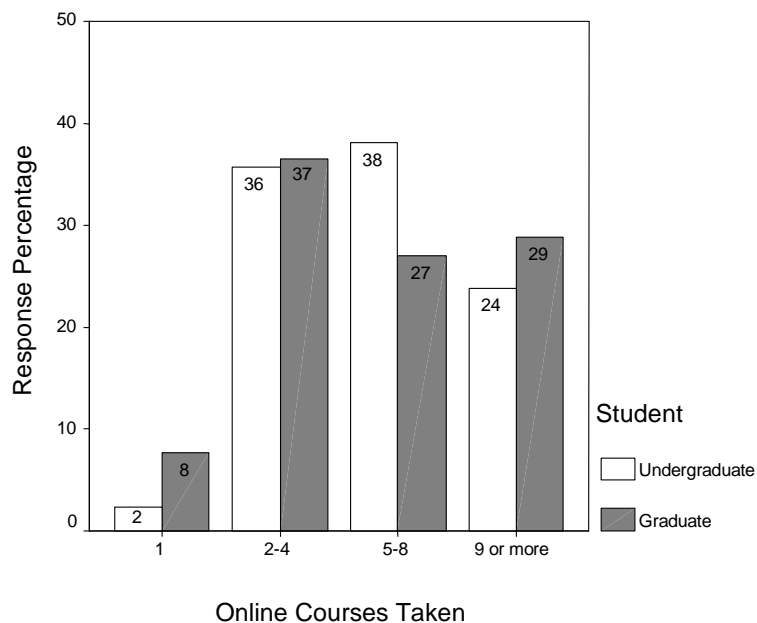


Figure 1. Undergraduate and graduate students' response percentages regarding the number of online courses taken.

In summary, students indicated that the convenience and flexibility of online courses were the primary reasons that they chose to learn online. Although the majority of both groups of students responded that they enjoy the flexibility of online courses, there was a significant difference between the responses of undergraduate and graduate students, suggesting graduate students valued the flexibility of online courses more than undergraduate students did.

In terms of the other reasons student choose to take online courses, there were no significant differences found; however, the majority of both groups of students responded that they take online courses for convenience and could not attend school if courses were not online. These findings suggest that undergraduate as well as graduate students highly value the beneficial features of convenience and flexibility of online courses.

Chapter Summary

This chapter described the participants and provided demographic information. Further, the results of research questions were presented in descriptive statistics: means, standard deviations, and percentages. In addition, comparative study results for the difference in undergraduate and graduate students' perceptions of interaction and reasons for taking online courses were presented.

CHAPTER V

CONCLUSIONS

Introduction

In this study, students' perceptions of online learning interactions and the reasons students choose to learn online were investigated. The summary of the study, discussions, and interpretation of the results are presented in this chapter. Additional information is presented regarding implications of the study, its limitations, and future research recommendations. The chapter ends with a summary.

Summary of the Study

The first research question was "How do students perceive interaction in the online learning environment?" The analysis of data indicated that students perceived interaction as an important factor for their online learning experience. Most students reported that receiving timely feedback from the instructor is a crucial element for their success and persistence in online learning, and monitoring their own progress each week is particularly important in the online learning environment.

The second research question was "What are the differences between undergraduate and graduate students' perceptions of online interaction?" The analysis of data indicated that there was a significant difference in the way undergraduate and graduate online students perceived content interaction. This finding suggested that more

graduate students preferred courses that were partially individualized with some instructor direction and that they like less to participate in case studies online than did undergraduate students. Although both groups of students strongly agreed that it is important to receive timely feedback from their instructor and to monitor their own progress, there were no significant differences in the ways undergraduate and graduate students perceived the conversation and collaboration, intrapersonal/metacognitive, and support interactions. The findings suggested that the more advanced learners, graduate students, perceive these interactions no differently than undergraduate students.

The third research question was “Why do students choose to take online courses?” A majority of students reported that they take online courses for the convenience and flexibility. Further analysis of data indicated that there was a significant difference between the responses of undergraduate and graduate online students; more graduate students value the flexibility of online courses than undergraduate students. There were no significant differences between the responses of undergraduate and graduate students regarding the convenience of online learning or the necessity of taking online courses. Although there were no significant differences, the majority of both groups of students reported that they take online courses for convenience and could not attend school if the courses were not online. The majority of participants were experienced online learners: they had taken two or more online courses. This finding indicates that online courses are not optional, but necessary in order for students to learn.

Discussion

This section includes discussions of the study findings in relation to the literature. In the first section, the findings of research questions 1 and 2 are discussed because both

research questions were related to students' perceptions of online interaction. The discussions of these two research questions are then further organized by the four online interaction attributes measured by the Online Learning Interaction Inventory (OLII) for undergraduate and graduate students. Lastly, the findings of Research Question 3 are discussed, followed by the discussion summary.

Research Questions 1 and 2

The first research question was "How do students perceive interaction in online learning?" and the second research question was "What are the differences between undergraduate and graduate students' perceptions of online interaction?" The study results suggest that students perceive interaction as an important variable in online learning. This finding was expected because the previous research (Northrup, 2002) revealed that students perceive interaction as an important element in their online learning experience.

Content interaction. Interacting with content is an important element of an online course in which new knowledge and skills are presented (Northrup, 2002). Content interaction is a basic characteristic of education; without content interaction, other interactions could be limited to social chats rather than a quality educational experience (Anderson, 2003). The current study participants seemed to agree that interacting with content is a major component in online learning. For the content interaction attribute, the means (with standard deviations in parentheses) for undergraduate students and graduate students were 3.23 (0.30) and 3.43 (0.33), respectively. Further, a significant difference between undergraduate and graduate students' perceptions of content interaction was found, indicating that undergraduate and graduate students perceive content interaction

differently. The results indicated that a considerably higher 87% of graduate students agreed or strongly agreed that they enjoy courses that are partially individualized, with some instructor direction, whereas only 60% of undergraduate students agreed or strongly agreed that they enjoy courses that are partially individualized with some instructor direction. Once again, a higher 64% of graduate students reported that they prefer everyone in the course moving at the same pace, whereas 55% of undergraduate students reported that they prefer everyone in the course moving at the same pace. Interestingly, over 90% of both groups of participants reported that one of the reasons they take courses online is the flexibility of online courses, yet less than 40% of participants reported that they enjoy courses that are completely individualized with no structure, suggesting that participants perceive the flexibility of online learning in terms of convenience of time and place, not individualized courses without structure. Content interaction can be presented asynchronously using multimedia such as audio, video, text, and graphics to meet the accessibility and flexibility needs of online students (Anderson, 2003).

Content interaction could include instructional strategies using multimedia to support the overall course learning goals (Northrup, 2002). The current study results seem to support this claim; approximately 86% of undergraduate and 79% of graduate students reported that online interaction should vary based upon the learning outcome. Content interactions involving innovative instructional strategies were more desired by undergraduate students. A higher percentage of undergraduate students agreed or strongly agreed that they liked to debate ideas with peers online (55%), to participate in case studies online (71%), and to learn from audio-narrated presentations (48%) than did graduate students. A few graduate students indicated that they prefer content interactions

involving a variety of instructional strategies; graduate students reported that they like to debate ideas with peers online (46%), to participate in case studies online (37%), and to learn from audio-narrated presentations (46%). Northrup (2002) found that students expressed strong frustrations about being required to do too many of these interactive assignments in a week; similarly, the current study participants, 81% of undergraduate and 75% of graduate students, reported that mandating too many interactive assignments in a week frustrates them. A high level of interaction is not always perceived as a quality educational experience but can be perceived as just busywork, which can lead students to frustration. These results suggest the importance of ascertaining learners' perspectives of online learning interaction (Northrup, 2002).

In summary, the means of the content interaction indicated that students regarded the content interaction as an important factor in their online learning experience. A significant difference was found between undergraduate and graduate students in their perceptions of content interaction, indicating undergraduate and graduate students perceive content interaction differently. More graduate students than undergraduate students indicated a preference for partially individualized courses and participation in structured learning games online. However, a majority of both groups of students agreed that various interaction strategies should be incorporated based upon the learning outcome.

Conversation and collaboration. The means (with standard deviations in parentheses) of the conversation and collaboration interaction for undergraduate students and graduate students were 3.16 (0.40) and 3.14 (0.48), respectively. The means indicated that participants rely on their peers and instructors in the online community. There was

no significant difference between undergraduate and graduate perceptions of the conversation and collaboration interaction attribute. Over 60% of both groups of students reported that they like to share information with peers and to discuss ideas and concepts with peers online. And although not significantly different, it seemed that undergraduate students value the forming of a community of learners and collaborating with peers more than did graduate students. Whereas over 50% of undergraduate students agreed or strongly agreed that it was important to get to know their peers and to get feedback from their peers online, only 44% of graduate students reported that it was important to get to know their peers, and only 39% indicated that it was important to get feedback from peers online.

Researchers have reported that undergraduate and graduate students interact differently in online learning. Vafa (2002) found that undergraduate online students prefer to learn with a group of other students, but graduate online students prefer to learn alone. Other researchers also reported that younger online students found peer interaction to be stimulating and motivating, but peer interaction was not so important for older and advanced learners, who tend to be more self-motivated (Furst-Bowe, 2001; Salinas, 2002).

In terms of feedback from the instructor, participants overwhelmingly stressed the importance of receiving feedback from their instructors. Approximately 93% of undergraduate students and 96% of graduate students reported that it is important to receive feedback from their instructor; however, over 70% of both groups of students reported that they do not require daily feedback from the instructors. This finding is consistent with Northrup's (2002) results. Supportive, timely feedback from the instructor is a major factor in relation to online learner motivation and persistence (Anderson, 2003;

Furst-Bowe, 2001; Jiang & Ting, 1999; Sciuto, 2002). Feedback from the instructor is particularly important in the online learning setting for closing the communication loop; furthermore, online students must perceive the message loop is complete (Northrup & Rasmussen, 2000). Even highly self-directed learners are influenced by feedback from the instructor; feedback can impact their persistence in online learning (Sciuto). The ability of instructors to keep students engaged in the online learning community is a key factor in low attrition in online courses (Anderson; Carr, 2000).

In summary, there was no difference between undergraduate and graduate students' perceptions of conversation and collaboration interaction. Although it appeared more undergraduate students relied on feedback and support from their online learning community than did graduate students, the difference was not significant; and both groups of students strongly agreed that receiving supportive feedback from the instructor was a very important factor for their online learning experiences.

Intrapersonal/metacognitive. The means (with standard deviations in parentheses) of the intrapersonal/metacognitive interaction for undergraduate students and graduate students were 3.23 (0.50) and 3.31 (0.49), respectively. The means indicated that participants regarded self-directedness as an important element in learning online, and they valued helpful embedded cognitive strategies in online courses. There was no significant difference between undergraduate and graduate perceptions of intrapersonal/metacognitive interaction. Both groups of students strongly agreed that monitoring their own progress is an important factor in online courses. Regardless of the student's status as either an advanced or novice online learner, self-monitoring the learning progress is important in online courses because online students are physically

separated from the instructor and peers and are working independently. Online students need to monitor their progress continuously and adjust their learning strategies based on their progress, as well as manage time to complete required online activities (Northrup, 2002). Approximately 93% of undergraduate and 98% of graduate students affirmed the importance of monitoring their own learning progress in the online learning environment. The participants in Northrup's study also reported that monitoring their own progress was the most important factor in the online learning environment.

For learning to take place, students must interact with and process the content of the course; the content cannot just pass before a student's senses but must be processed cognitively. Through intrapersonal/metacognitive interaction, students take what is learned at the personal level and integrate it with existing experiences and organize it into meaning (Berge, 1999). This interaction is an important skill for online students to achieve success, but this element of online course design is often neglected. It is important to embed many cognitive strategies within online courses to provide helpful ideas for independent learning and time management (Northrup, 2002). Most participants identified that embedded cognitive strategies are important tools for their online learning experience. About 80% of undergraduate and 90% of graduate students reported that having structured times for assignments to be due is important, and over 50% of both groups of students indicated that preparing an advance organizer each week helps them. Approximately 54% of undergraduate and 69% of graduate students reported that note-taking guides to accompany presentations are helpful; however, a majority of them indicated that it is not necessary to provide a graphical flowchart of the steps they should take in completing the lessons.

In summary, there was no difference between undergraduate and graduate students' perceptions of intrapersonal/metacognitive interaction. Although more graduate students preferred cognitive tools such as note-taking guides, the difference was not significant. Both groups of students strongly agreed that monitoring their own progress and having structured times for assignments were very important factors for their online learning experiences.

Support. The means (with standard deviations in parentheses) of the support interaction for undergraduate students and graduate students were 3.80 (0.55) and 3.78 (0.56), respectively. The means indicated that participants perceived the support interaction as an important element in the online learning environment. There was no significant difference between undergraduate and graduate perceptions of the support interaction.

Consistent with Northrup's (2002) findings, participants reported that being able to get in touch with the instructors and receiving timely responses from the instructors are the key factors that influence their motivation and persistence in online learning. Approximately 98% of all participants reported that receiving timely responses from their instructors was highly important, and 83% of undergraduate and 77% of graduate students indicated that being able to get in touch with instructors was necessary for their ongoing success in online courses. They also reported that tips and support from peers were extremely valuable; however, more undergraduate students (86%) appeared to value support from their online peers than did graduate students (69%). Nevertheless, this difference was not significant, and the finding is consistent with findings of other studies (Salinas, 2002; Vafa, 2002).

As for the use of technology, participants were fairly competent with the use of technology. Only 33% of undergraduate and 38% of graduate students reported that they need tutorials to assist them in using chat rooms or threaded discussions. These findings were somewhat different from those for Northrup's (2002) study. It appeared that the current study participants required less use of tutorials to assist them in using the technology to interact with content and others. One of the possible explanations for this might be that the current study participants have had more experience in learning online than did earlier participants. About 95% of the study participants reported that they had taken two or more online courses, in contrast to 73% in Northrup's study. Still, even as experienced online students, over 83% of undergraduate and 100% of graduate students reported that they are extremely frustrated when the technology does not perform as the directions say that it should. According to Furst-Bowe (2001), the majority of online students express frustration in dealing with some types of technical problems at one time or another. Researchers found that the successful completion of online courses is often dependent upon the ease of use of technology (Ehrlich, 2002; Palloff & Pratt, 2001; Schrum & Hong, 2002).

In summary, there was no difference between undergraduate and graduate students' perceptions of intrapersonal/metacognitive interaction. Most undergraduate and graduate students strongly agreed that timely responses and the ability to get in touch with their instructors were very important factors for their ongoing success in online courses, and few students reported that they require technical support.

Summary of Research Questions 1 and 2. Overall, participants reported that online interactions are important elements for their online learning experiences. Data

analysis indicated that undergraduate and graduate students perceived content interaction differently. Compared to undergraduate participants' responses, graduate participants preferred online courses that are partially individualized with some instructor direction and everyone in the course moving at the same pace. However, undergraduate students reported that they enjoy online courses with various innovative content interaction strategies, such as participating in case studies, debating ideas with peers online, and learning from audio-narrated presentations. As for other interaction attributes, the results indicated that undergraduate and graduate students perceive them somewhat differently but not to a level of significance. Although the findings indicated that there were no significant differences, high percentages of undergraduate and graduate students reported that receiving timely feedback from instructors and monitoring their own progress are the most important factors in their persistence in an online learning environment. Participants also valued their online learning community, indicating that getting to know peers online and receiving tips from peers was important for their online learning experiences.

Research Question 3

Why do students choose to take online courses? Researchers found the primary reasons for students taking online courses are the convenience and flexibility offered by online courses (Diaz, 2000; Northrup, 2002; Salinas, 2002), and the current study results support their findings. A majority of participants indicated that they take online courses for convenience and flexibility. Over 90% of undergraduate and 98% of graduate students reported that they enjoy the flexibility of online courses. Further analysis indicated that there was a significant difference between the responses of undergraduate students and graduate students related to the flexibility of online courses. This finding

suggested that more graduate students value the flexibility of online courses than do undergraduate students. In terms of convenience, approximately 74% of undergraduate and 87% of graduate students agreed or strongly agreed that they take online courses for convenience. It seemed that more graduate students value the convenience of online courses than undergraduate students; however, additional analysis indicated that there was no significant difference between the responses of undergraduate and graduate students. Online courses are typically asynchronous in nature, allowing students to learn without constraints of a specific time and place (Northrup, 2001; Olgren, 2000). The majority of online learners are adults who have family or work responsibilities; learning online permits participants to attend class without having to be away from their homes or workplaces (Aslanian, 2001; Picciano, 2001). Consistent with the literature review, the majority of the current study participants (72%) were older than age 25. However, one of the interesting points was that participants under age 25 also selected online courses for the convenience and flexibility. It appears that the beneficial features of online courses are important factors to younger students as well as to older students. Furthermore, an increasing number of students indicated it would be difficult to take the course if it were not offered online. Approximately 55% of undergraduate and 52% of graduate students reported that they could not attend school if courses were not online, and the difference was not significant between the two groups of students. These percentages indicated an increase from 23% over the previous study results (Northrup, 2002). The features of convenience and flexibility of online courses are no longer nice-to-have options but necessities for some students to participate in education and training opportunities. One of the main benefits of online learning is its ability to reach people who otherwise might

not have access to learning opportunities (Moore & Kearsley, 1996). It appears that students increasingly take advantage of the flexible nature of online learning opportunities; 98% of the undergraduate students and 92% of graduate students in the current study reported that they had taken two or more online courses, in contrast to 73% of Northrup's (2002) participants.

In summary, older as well as younger participants highly value the convenience and flexibility of time and place that online courses offer. Although there was a difference between undergraduate and graduate students' reason for taking online courses in terms of the flexibility factor, there was no difference between those students' reason for taking online courses in terms of convenience. More undergraduate students as well as graduate students choose to take online courses for the convenience offered by online courses. Furthermore, an increased percentage of students indicated that they could not attend school if courses were not online, indicating the main beneficial features of convenience and flexibility of online courses are not optional but necessary in order for students to learn. Only about 24% of undergraduate and 21% of graduate participants reported that they prefer campus-based courses to online courses, suggesting strong demands for online education courses.

Summary of Discussion

The majority of online learners are adults who have family and/or work responsibilities (Aslanian, 2001; Picciano, 2001; Waits & Lewis, 2003). The current study results indicated, however, not only adults but also younger or traditional students prefer to learn online. Among undergraduate students, only 24% indicated that they prefer campus-based courses to online courses. Over 90% of all participants have taken

two or more online courses; the primary reasons for taking online courses, they reported, are the convenience and flexibility of online courses. The results of this study support Northrup's findings on students' perceptions of online interaction; results suggested that participants perceive online interaction attributes as important elements for their success and persistence in online learning.

Furthermore, undergraduate and graduate online students perceive the level of the course structure, pacing, and other content-related interactions differently. There was a significant difference between how the two groups perceive content interaction. It seemed that more graduate online students enjoy courses that are partially individualized with some instructor direction. However, more undergraduate students seemed to enjoy innovative content interaction strategies, participating in case studies online, debating ideas with peers, and learning from audio-narrated presentations.

As for other attributes, the results indicated that undergraduate and graduate online students perceive conversation and collaboration, intrapersonal/metacognitive, and support interaction attributes no differently. It seems that both undergraduate and graduate online students highly value feedback and timely responses from their instructor. This finding is in keeping with those of other researchers who have found that timely feedback from instructors is an important factor in online students' motivation and persistence (Anderson, 2003; Furst-Bowe, 2001). Sciuto (2002) found that even highly self-directed students are influenced by supportive and timely responses from their instructors. In addition to receiving timely feedback from instructors, participants reported that monitoring their own progress each week was extremely important for their success in learning online. Participants seemed to value the online learning community

and interaction with other students; however, it seems that undergraduate students valued these more than did graduate students. Undergraduate students reported that to get to know peers, to discuss ideas and concepts with peers, and to receive tips from peers are extremely important in an online learning environment. This finding was consistent with the findings of other studies that undergraduate students prefer to interact more with peers online than do graduate students, who prefer to learn alone (Furst-Bowe, 2001; Salinas, 2002; Vafa, 2002).

There may be a number of reasons pointing to why there were no significant differences between graduate and undergraduates. As previously pointed out, graduate students tend to prefer to learn on their own, and a more significant level of difference between their responses and those of undergraduates would be anticipated. One reason for the lack of difference between graduate and undergraduate students' responses may be related to the finding that over 90% of both graduate and undergraduates in the study reported they had previously taken one or more online courses. This may be in part due to the expansion of online courses available at the University of West Florida (UWF). The students responding to the survey, therefore, have had experience in taking online courses. Another reason may have to do with the growth of Internet technology over the last few years. Interactive websites, such as MySpace, FacePage, and YouTube, have been available for the last few years, and undergraduate and graduate students have had exposure to these, in addition to taking interactive courses online. These other venues of online interaction, in addition to the online class, may be shaping both graduate and undergraduate students' perceptions concerning online interaction.

In terms of the reasons students choose to take online courses, over 90% of both groups of students reported that the reason for taking online courses was the flexibility of time and place that online learning offers. Although both groups of students responded in high percentages, there was a significant difference between undergraduate and graduate students' responses; more graduate students indicated that they highly value the flexibility of online courses than undergraduate students, implying that older students who have family and/or work responsibilities require the flexibility of online courses in order to learn. However, there was no difference between the students' reason for taking online courses in terms of its convenience. The majority of both groups of students indicated that they take online courses for convenience. It seems that an increasing number of undergraduate students as well as graduate students choose to take online courses for the convenience of online courses. Furthermore, an increased percentage of students indicated that they could not attend school if courses were not online, indicating the main beneficial features of convenience and flexibility of online courses are not optional but necessary in order for students to learn. Only about 24% of undergraduate and 21% of graduate participants reported that they prefer campus-based courses to online courses, suggesting strong demands for online education courses.

Implications of Findings

In this study, students' perceptions of online interaction and the reasons students choose to take online courses were investigated. Based on the study results, there are implications for faculty, students, and administrators, which are included in the following subsections.

Faculty

To address the issue of high attrition rates in online courses, researchers suggested examining online interaction, which is one of the variables that influence students' satisfaction and persistence in online learning (Anderson, 2003; Berge, 1999; Northrup, 2002; Picciano, 2002; Tillman, 2002). Northrup further suggested examining online interaction from students' perspectives. With a lack of visual and facial cues, students can easily misinterpret the meaning of communication in an online learning environment (Dillon & Greene, 2003). Some students may interpret a high level of feedback from an instructor as positive, whereas others may interpret it a negative sign. More interaction is not always better but may be perceived as just busywork, which can lead students to frustration (Northrup).

The results of this study indicated that students perceive online interaction as an important element that influences their persistence and satisfaction in online courses, particularly supportive feedback and timely response from the instructor. Moreover, the data indicated that helpful, embedded cognitive tools to monitor students' progress are important design elements to online students. Understanding what factors influence students' persistence in online courses could aid instructors to incorporate appropriate interactive strategies to facilitate students' learning in the course and improve feedback to students on how they are progressing in the course.

Students

The results suggested that the current study participants have more experience with online courses than did the students from Northrup's (2002) study. Still, there were

some students taking their first online course. They may have not realized the self-directed nature of online learning or may have had a preconceived idea that the online course was not as demanding as the campus-based course. Therefore, it is important that an online orientation session include course expectations and helpful tips for succeeding in an online learning environment.

Administrators

Convenience and flexibility are two factors that make online courses attractive to students. As indicated in other studies, the primary reasons that adults take online courses are the convenience and flexibility offered by online learning (Diaz, 2000; Northrup, 2002; Salinas, 2002). However, the current study results indicate that younger, traditional-college-age students are also choosing online courses in order to allow learning to take place when they want. Over 90% of both groups of students indicated that they take online courses for flexibility. In terms of the convenience factor, there was no difference between undergraduate and graduate students; both groups highly valued the convenience of online courses. This result implies an increasing demand for online learning. Administrators should consider a strategic plan for online program expansions that includes providing an appropriate infrastructure and supporting the staff and budgets to provide and expand online courses. In addition, the online course environment requires a new demand on instructors. They are challenged to create appropriate and effective online courses using different innovative instructional technologies. Instructors will need ongoing support and training to create and facilitate effective online courses.

Limitations of Study

This study was focused on the perceptions of online interaction for two groups, undergraduate and graduate students; therefore, the effects of the teaching styles of different instructors and content were not differentiated in this study. Also, whereas the convenience sampling method is valid and widely used in educational research, a study using convenience sampling should not be over generalized because the participants have not been systematically selected. Finally, a survey research method was used for this study. Because the method relies on a self-reporting questionnaire, the accuracy of data is limited by the honesty of participants' responses.

Future Research Recommendations

Based on the findings and conclusions of this study, the following recommendations are offered for future research:

1. More studies on students' perceptions of online interaction using larger samples would be beneficial to education researchers.
2. Replication of this study in a different school or with participants from a different discipline could benefit educators by giving a broader spectrum of students' perceptions of online interaction.
3. Similar studies could be conducted to further investigate the relationship between students' perceptions of interaction and the retention/attrition rates of online students.

Chapter Summary

The results of this study might provide education practitioners with insights into students' perspectives of online interaction. Students perceive online interaction as an important variable in their online learning experiences; by understanding how online interaction influences students' motivation and persistence in online learning, educators may come to better understand the retention problem in online learning. The results of this study provided information that can be used to select an appropriate level of interactive strategies and facilitate online courses more effectively.

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APPENDIXES

Appendix A

Institutional Review Board (IRB) Approval


Research and Sponsored Programs

Building 11, Room 109
 11000 University Parkway
 Pensacola, FL 32514-5750

March 29, 2007

Mr. Myong Sun Kim
 604 Kirk Road
 Apt. 19
 Decatur, GA 30030

Dear Mr. Kim:

The Institutional Review Board (IRB) for Human Research Participant Protection has completed its review of your proposal titled "Online Interaction: An Investigation of Undergraduate and Graduate Students' Perceptions" 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 and Sponsored Programs 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 Sponsored Programs. 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 Sponsored Programs 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.


Phone 850.474.2824 Fax 850.474.2082

Web research.uwf.edu

An Equal Opportunity/Equal Access Institution

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

Sincerely,


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



Dr. Christine Cavanaugh
Interim Director, Research and Sponsored
Programs

cc: Dr. Karen Rasmussen

Appendix B
Invitation To Participate

Dear UWF Online Students,

Hello, my name is Myong Kim, and I would like to offer you:

- (1) An opportunity to make a valuable contribution to educational research by responding to 52 online learning questions that will take 10-15 minutes.
- (2) A chance to win a \$50 Barnes and Noble gift certificate for your participation.

I am conducting this study as part of my doctoral dissertation in the field of Instructional Technology at the University of West Florida. The purpose of my study is to investigate students' perceptions of online learning interaction. I am inviting approximately 200 online students to complete the Online Learning Interaction Inventory.

I hope you will choose to participate in this study opportunity. By sharing your experiences, I hope to gain some insight regarding different aspects of your online interactions. Your contributions will provide insightful information about online learners' perceptions of interaction and factors that may affect learner satisfaction.

The survey has 52 background and interaction questions, which will take approximately 10-15 minutes to complete. Your participation is voluntary. Your responses will remain completely confidential and anonymous. This study result will be presented by undergraduate/graduate status, ethnicity, gender, and age.

Thank you in advance for participating in this study. In appreciation for your valuable contribution, I will enter all participants' e-mail addresses in a drawing for a \$50 Barnes and Noble gift certificate on May 4, 2007 and notify the winner. For those who want to be included in this opportunity, please provide your e-mail address for notification.

Please complete your survey responses before April 29, 2007. If you have any questions or problems responding to this survey, please contact me at 404-547-7424 or msk4@students.uwf.edu

If you are ready to complete the survey, click on the link below.
Survey Site: <http://www.surveymonkey.com/s.asp?u=818983627966>

Sincerely,

Myong Kim, Ed. D. Candidate
Instructional and Performance Technology

Appendix C
Survey Questions

***** Online Learning Interaction Survey *****

[Exit this survey >>](#)

Welcome! I appreciate your willingness to help and make your valuable contribution to my educational research. This survey has 52 questions and takes 10-15 minutes to complete.

For items 7-52, please use the following scale:

___ Strongly disagree

___ Disagree

___ Not sure

___ Agree

___ Strongly agree

After completing all the items, please select ;°Submit;± at the bottom of the page. Once again, thank you for your participation. If you have questions, please contact me at msk4@students.uwf.edu

1. Please provide your email address (optional-only for the gift certificate drawing purpose):

2. Please indicate the course level you are currently enrolled in:

Undergraduate

Graduate

3. Please indicate your gender:

Male

Female

4. Please identify your age group:

Under 25

26-35

36-50

over 50

5. Please indicate your ethnicity:

African-American

Caucasian

Hispanic

American Indian/Alaskan Native

Asian/Pacific Islander

6. How many online courses have you taken including current online course(s)?

1

2-4

5-8

9 or more

7. I take online courses for convenience:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

8. I enjoy courses that are completely individualized/no structure:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

9. I do not like participating when I feel like I am doing busywork:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

10. It is important to get to know my peers online:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

11. It is important to monitor my own progress each week:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

12. It is important to me for an instructor to be very timely in his/her responses back to me:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

13. I enjoy courses with a lot of structure, everyone moving at the same pace:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

14. It is frustrating when there are too many interactive assignments in a week:

- (1) Strongly disagree

- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

15. I don't see why it is necessary to build a community of learners in an online environment:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

16. Having structured times that assignments are due is important:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

17. I don't really require the assistance of a mentor to guide me through clarification of technical and confusing information:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure

(4) Agree

(5) Strongly agree

18. I enjoy the flexibility of online courses:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

19. I like courses that are partially individualized with some instructor direction:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

20. Feedback from the instructor should occur at least two times a week:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

21. I like to share information with my peers:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

22. Having posted times for chat sessions is important:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

23. I need tutorials (at least access to them) to assist me in using chat rooms, threaded discussions, etc.:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

24. I like to participate in case studies online:

- (1) Strongly disagree

- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

25. Interaction should vary based upon the learning outcome:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

26. I could not attend school if courses were not online:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

27. I don't think that forming a study-buddy group is necessary:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree

(5) Strongly agree

28. I don't need an instructor to encourage me to log on several times throughout the week:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

29. Tips from my peers are extremely valuable:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

30. I like to debate ideas with my peers online:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

31. Working in teams for projects is hard for me:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

32. I enjoy participating in structured games:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

33. I like to keep the same team for the entire semester:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

34. Preparing an advanced organizer each week helps me organize my thoughts:

(1) Strongly disagree

(2) Disagree

- (3) Not sure
- (4) Agree
- (5) Strongly agree

35. I am very frustrated when I am confused about assignments:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

36. I don't enjoy readings followed by online discussion:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

37. I do not require daily feedback from my instructor:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

38. It is important to be available to tutor my peers:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

39. Providing a graphical flowchart of the steps I should take in completing the lesson isn't necessary for me:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

40. Getting in touch with my instructor is necessary for my ongoing success in the course:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

41. I just wanted to try out an online course:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

42. I do not like posing questions to experts:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

43. I learn best through textbook readings:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

44. I enjoy serving as a guest presenter in class:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

45. Including note taking guides to accompany PowerPoint presentations is helpful to me:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

46. It is extremely frustrating when the technology doesn't perform as the directions say that it should:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

47. I prefer taking campus-based courses to online courses:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

48. I enjoy discussing ideas and concepts with peers:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

49. I do learn well from audio-narrated PowerPoint presentations:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

50. I do not learn well from online text:

- (1) Strongly disagree
- (2) Disagree
- (3) Not sure
- (4) Agree
- (5) Strongly agree

51. It is important to me to get feedback from my peers:

- (1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

52. Getting feedback from instructors isn't important to me:

(1) Strongly disagree

(2) Disagree

(3) Not sure

(4) Agree

(5) Strongly agree

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