

LEARNER CHARACTERISTICS AS PREDICTORS OF ONLINE COURSE COMPLETION
AMONG NONTRADITIONAL TECHNICAL COLLEGE STUDENTS

by

CHANDLER CLAY NEWELL

(Under the Direction of Bradley C. Courtenay)

ABSTRACT

This exploratory study examined four student characteristics and their effect on successful online course completion for a large population of adult students. The purpose of this study was to determine the influence of age, gender, ethnicity, and financial aid eligibility on successful completion rates for nontraditional adults participating in online technical college courses.

The participants in the study were 89,473 students enrolled in online technical college courses offered through the Georgia Virtual Technical College (GVTC), part of the Georgia Department of Technical and Adult Education. Data for these students were analyzed using quantitative methods in order to determine whether age, gender, ethnicity, or financial aid eligibility were significant predictors of successful course completion.

The study found that age, ethnicity, and financial aid eligibility were significant predictors of online course completion. Older students, white students, and students not eligible for Pell grants were more likely to successfully complete online courses.

INDEX WORDS: Adult Education, Persistence, Completers, Non-completers, Web-based Education, Online distance education, Technical Colleges, Nontraditional students, Personal characteristics

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DEDICATION

To Allison, Kate, Abbie, and Natalie.

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CHAPTER 1

INTRODUCTION

Context of the Problem

Recent advances in telecommunications and information technologies have transformed nearly every aspect of contemporary society. Technology now impacts the way adults live, work, play, and learn. The phenomenal growth of the Internet in recent years has created an information-rich world, one in which access to just about any fact or figure is no further than a mouse click away.

Modern adult distance education has also been radically changed by the information technology explosion. Correspondence courses, one-way video broadcasts, and even satellite teleconferences are rapidly disappearing as educational institutions take advantage of the nearly universal accessibility and popularity of the Internet. Utilizing the Internet as a means of delivering educational content, often referred to as online education or web-based education, is becoming the distance education method of choice for most postsecondary educational institutions. Nearly all distance education programs now include at least some online components (Moore & Kearsley, 2005). Online program offerings and enrollments are growing so rapidly that it is difficult to arrive at an estimate of their current numbers, and it is to be expected that any data currently available on online enrollments will become outdated very quickly. A recent report from the Sloan Consortium by Allen and Seaman indicates that 63% of postsecondary schools that offer undergraduate face-to-face courses also offer at least some online courses (2005). The report also describes an increase in enrollment from 1.98 million

students nationally in 2003 to 2.35 million in 2005, a “growth rate of over ten times that projected by the National Center for Education Statistics for the general postsecondary student population” (p. 3). Online distance education is thriving especially well in the southeastern portion of the country, where 78% of institutions offering Associates degrees considered it a part of their long-term strategy in 2005, up from 62% in 2003 (Allen & Seaman, 2006). The exponential growth of online distance education is often described as unprecedented by any other development in the realm of education at any level (Daniel, 1996; Jones, 1997).

Although this rapid expansion is not a purely American phenomenon, educational institutions in the United States are leading the rest of the world in terms of online program offerings and enrollments. Several explanations have been proposed for this. Carr-Chellman (2005) states “Web-based learning offerings proliferate particularly in America because the enterprise appeals to some of our most basic, stereotypically American values” (pp. 145-146). These values include an open educational system, efficiency, and the desire for independence. It has also been suggested that the competitive nature of the American free-enterprise system makes getting an education online highly appealing not only to educational institutions, but to other organizations as well (Carr-Chellman, 2005). For example, the online education trend is also expanding at unmatched levels in corporate training environments (Whiteman, 2001), as private businesses and industries take advantage of the convenience and cost-effectiveness of training their employees online (Brown, 2000; Horton, 2000).

While the rise of online distance education has expanded learning opportunities for all students, it is often most attractive to nontraditional students who are more likely to have job and family obligations that make attending traditional classes difficult (Aslanian, 2001; Rubenson, 1986). The increasing availability of reputable, quality online courses is changing the way adults

think about attending college. The willingness of adults to participate in online distance education programs is creating a new and rapidly changing market for postsecondary education institutions. A study performed by the University Continuing Education Association (2000) found that among adult learners who successfully complete distance education courses, 90% were satisfied with the experience and would most likely enroll again.

While many might argue that the popularity of online distance education is one of the greatest revolutions the world of education has seen, it does not come without problems. Holmberg (1994) asserts that there is often a higher incidence of dropout when learners are separated from each other and their instructor. This assertion is echoed by Kember (1995) , who noted that high dropout rates have long been associated with distance education. Dropout rates are typically much higher in online distance education courses when compared to traditional on-campus courses (S. Carr, 2000; Chyung, 2001; Frankola, 2001; Martinez, 2003; Nash, 2005; Palloff & Pratt, 2003). Lynch (2001) observed that in her institution student dropout rates in online courses were as high as 35% to 50%, while the dropout rate in traditional face-to-face courses averaged 14%. Lorenzetti (2002) agrees, citing dropout rates near 50% as common. Moore and Kearsley (2005) contend that in recent years the actual dropout rate is improving, especially in university credit courses. It also seems that students new to the online learning experience are often more likely to drop out than those who have taken several online courses. A study by Rubenson (1986) found that in most distance learning environments, students are far more likely to drop out near the beginning of a course rather than the end. Fenner (1998) found that in online degree programs, students are most likely to drop out during the first two online courses of their program of study.

Although we know that students drop out of online courses at higher rates than on-campus courses, there is still much to learn about why this happens. Research has typically focused on social, institutional, and academic factors that may impact dropout or completion, but there is little empirical data to describe the personal characteristics of students that alone or in combination may lead to successful completion or dropout of online distance education courses. A few recent studies have attempted to address the online dropout problem by examining personal characteristics.

Jun (2005) studied adult learners in corporate online courses and found gender to be a strong influence on dropout, with men dropping out more frequently than women. Muse (2003) found that older students were more likely to persist in his study of community college Web-based classes. Wojciechowski and Palmer (2005) agree, finding that age was positively correlated to completion in their study of community college students in online courses. Neighbors (2004) conducted a qualitative persistence study of graduate students enrolled in an online certificate program and found that those who adapted well to the online learning environment were more likely to persist. Wiggam (2004) studied the effects of delivery method and student characteristics on persistence in a university undergraduate program, and found ethnicity and financial aid status to be significant factors in predicting persistence. A common thread among all these studies is a strong recommendation that further research be conducted in this burgeoning field, as most of the studies involve small samples of fairly homogenous students in terms of age and other characteristics.

A 1999 review of the research on distance learning in higher education by the Institute for Higher Education Policy (Phipps & Merisotis, 1999) outlined seven gaps in the distance

learning research that warrant further study. One of these was its failure to explain online learning's high dropout rates:

In a number of studies, there was evidence that a higher percentage of students participating in a distance learning course tended to drop out before the course was completed compared to students in a conventional classroom. The issue of student persistence is troubling because of both the negative consequences associated with dropping out, and the fact that the research could be excluding these dropouts—thereby tilting the student outcome findings toward those who are “successful.”(pp. 5-6)

In addition to high dropout rates, what is also clearly evident is that the online student population is shifting towards higher numbers of nontraditional students, especially in community and technical college environments. Carr-Chellman (2005) contends that the vast majority of online program offerings are vocational in nature. This trend is also evident in Georgia's technical college system, where adult learners are enrolling in record numbers in online courses and programs.

While the lifetime earning potential of those with college degrees is appreciably higher, the fact remains that for a large percentage of American workers, a traditional four-year college degree is not a prerequisite for entering their chosen profession. Based on data from the Bureau of Labor Statistics, it is projected that eight of the ten occupations with the largest employment growth between the years 2004 to 2014 will not require a four-year college education (United States Department of Labor, 2005). These jobs often require skills that can be learned through on-the-job training or through short-term career training programs. Georgia's system of technical colleges, governed by the Department of Technical and Adult Education (DTAE), provides such

training to prepare its students for those jobs. The DTAE system is comprised of 34 technical colleges, 18 satellite campuses and four joint college technical divisions.

In 1998, the few technical colleges in Georgia that were offering courses online joined together to form what is now the Georgia Virtual Technical College (GVTC) in an effort to standardize policies and procedures and to pool their scarce resources. Within five years, every technical college in Georgia had joined in the effort. Each institution created its own unique course and program offerings for inclusion in the statewide GVTC course catalog. While nontraditional students over 25 years of age now comprise slightly less than half of students within DTAE colleges in general, they make up a majority of students enrolled in online courses through GVTC. Table 1 provides an overview of the Fall Quarter 2006 age distribution of students enrolled in Georgia's technical colleges. This table includes three age groups: traditional students aged 17-21, transitional students aged 22-24, and nontraditional students aged 25 and older.

Table 1. *DTAE Fall Quarter 2006 Age Distribution*

	Traditional Students (17-21)	Transitional Students (22-24)	Nontraditional Students (25 and older)
DTAE (total student population)	28.7%	23.6%	47.8%
GVTC (online students only)	18.1%	25.2%	56.6%

This influx of nontraditional students is creating a much more diverse student population. According to Palloff and Pratt (2003), “the demographics of the virtual student are widely confirmed: he or she tends to be older, working, and involved with family activities and the community”(p. 113). Within this broad category of non-traditional adult learners, diversity abounds. As Moxley, Najor-Durack, and Dumbrigue (2001) state, “post-secondary education is

now as diverse as the students who seek it” (p. 33). The face of the modern postsecondary adult learner is far from traditional. Considerable differences exist in terms of ethnicity, gender, age, socioeconomic status, population density, and other characteristics. An awareness of this diversity and sensitivity to the differences that students bring into the educational process is critical in maximizing the potential of making the diversity itself a positive part of the educational experience. “The diversity...creates different needs. The probability of a student discontinuing or even failing education lurks in these situations” (Moxley et. al, p. 36).

Studies that address this diversity in terms of its possible impact on completion of online courses are scarce, and those which have been conducted are often inconclusive or contradictory, and typically do not involve technical college students. Parker (1999) for example, in a study of community college students enrolled in distance education courses, examined the effect of several variables, including student characteristics, on dropout and found no relationship between age or gender on persistence. Muse (2003) conducted a similar study with community college students taking online courses, and found that gender was not related to persistence, but age had a positive effect on persistence. Findings regarding the effects of student characteristics have yet to establish a clear pattern of possible predictors of either dropout or persistence.

Statement of the Problem

Online distance education is experiencing tremendous success and expansion, and the postsecondary market is growing considerably. One of the larger segments served by online distance education is the adult population, those with conflicting job and family demands for whom online courses present several distinct advantages (Barone & Luker, 1999). Time and distance constraints are eliminated by the online format, allowing adult learners the opportunity to enroll in courses while continuing with their careers and family responsibilities.

Nationally, of all students who were enrolled in postsecondary degree-granting institutions, 42% are age 25 or older. In Georgia's technical college system, 57% of those enrolled in online courses are age 25 or older. Although this group comprises a majority of the online student body, online distance education is still in its infancy and it is unknown whether this population fares differently in terms of course completion than traditional students between the ages of 17 and 21, who are the subjects of most of the existing research in the field. In face-to-face, on-campus settings, nontraditional students have typically dropped out of college at higher rates than traditional students (Astin, 1975; Bean & Metzner, 1985). The primary reasons for these dropouts were determined to be related to variables external to the learning environment, such as scheduling, job conflicts, transportation, and family responsibilities. These external barriers are significantly minimized or even eliminated through enrollment in online courses. In light of these facts, a significant need for additional research is evident. Do the personal characteristics of technical college students enrolled in online courses have any effect on their completion rates? Are there differences in the completion rates of traditional and nontraditional students in online technical college courses? The current body of research fails to adequately answer these questions.

Purpose of the Study

The purpose of this exploratory study was to determine the influence of age, gender, ethnicity, and financial aid on successful completion rates for nontraditional adults participating in online technical college courses. The following three research questions guided this study:

1. To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?

2. To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?
3. To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?

Significance of the Study

With more and more adult learners choosing to enroll in online distance education courses, college administrators and instructors are in need of research-based solutions for retaining them. The high attrition rates cited in online distance education courses and their corresponding negative effects make the identification of at-risk adult learners and the implementation of intervention strategies to retain them a high priority. Martinez (2003) contends that “successfully reducing the dropout rate allows better allocation of delivery resources as well as providing improved return on investment”(p. 1). Muse (2003) also points out that numerous stakeholders are negatively impacted by student drop-outs. In addition to the sense of personal failure felt by the student, instructors, institutions, and financial aid providers all experience losses when students fail to persist. Muse agrees with Phipps and Merisotis (1999) in his assertion that the accuracy of the already limited research related to online distance education may even be skewed because of high dropout rates. Because learners drop out at higher rates in online courses, many research studies involving adults in online education programs or courses may inadvertently reflect a higher level of positive outcomes by failing to acknowledge those who drop out early.

This study helps to bridge the existing gap in the online persistence research by providing completion data based on student demographics for every member of a very large population of online students, thereby contributing to knowledge in the fields of adult education and online distance education. The current research pertaining to persistence and completion in online courses is heavily focused on traditional students in four-year college and university settings and typically addresses institutional and situational variables. Completion studies of nontraditional students enrolled in online community and technical college courses are practically nonexistent. Zhai and Monzon (2001, November) argue that the demographic profile of typical community college students makes successful completion much more of a challenge. Their age, residency, and work schedule make them much more likely to drop out than their traditional college counterparts. Nontraditional students comprise a significant percentage of the students enrolled in community and technical colleges, and make up a majority of those enrolled in online courses through Georgia's technical college system. This study focuses on these nontraditional students and their demographic variables that may influence completion.

This study has the potential for providing valuable information to instructors who advise or teach online learners. By identifying characteristics of students who may be at risk for dropping out, early interventions can be prepared and course materials and delivery may be designed to maximize opportunities for those most at risk. The identification of at-risk factors may also identify students for whom additional information and resources may be helpful.

Administrators and policy makers may also benefit from this study, as low retention rates often have multiple negative consequences. The financial losses, both for the student and the institution, can be significant. Concerns regarding accreditation always arise when retention rates

are low. From a public relations perspective, the negative publicity associated with high dropout rates is never welcome.

Finally, the students themselves may benefit from this study by learning which, if any, of their own personal characteristics may be associated with an increased likelihood of dropping out of online courses. A simple awareness of factors that may have contributed to the attrition of others can often help students focus on a commitment to persist in spite of those factors.

It is obvious that online distance education is steadily growing and constantly evolving. In order to maximize the benefits of this anticipated growth, a thorough understanding of student perseverance in online courses is essential, as the costs associated with losing students to dropout and recruiting new students are usually significant. The more that can be learned about why adults drop out of online courses, the greater the likelihood of keeping them enrolled through course—and ultimately program—completion.

While it is understood that learner persistence is a complex and multifaceted topic affected by a myriad of personal, environmental, and institutional variables, the study identifies the presence of specific factors, in isolation or in combination, which exist in the larger environment and may influence course completion.

Definition of Terms

Completer: A completer is defined as a student who has remained enrolled in a particular course for the duration of the academic term and has earned a minimum grade of D in the course.

Distance education – Distance education is an instructional model in which the learner and the instructor and other instructional resources are separated by space and/or time.

Online distance education: Also known as web-based learning or online learning, online distance education is a form of distance education in which the primary medium for

communication is the Internet. Students taking online courses have the flexibility of deciding when and where to take a course and complete assignments. Students may need to come to campus occasionally for scheduled meetings and/or examinations.

Nontraditional student – a student with a chronological age of 25 years or older.

Traditional student – a student with a chronological age of 17-21 years.

Transitional student – as student with a chronological age of 22-24 years.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this exploratory study was to determine the influence of personal characteristics on successful completion rates for nontraditional adults participating in online technical college courses. The following three research questions guided this study:

1. To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?
2. To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?
3. To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?

This literature review will summarize and assess existing research in order to provide a background for the concepts addressed in this study. The historical background of distance education will be addressed, followed by a review of the literature related to distance education theory and philosophy. The major theoretical models of distance learning will be then be summarized. The research pertaining to participation and motivation among adult learners will be discussed, both in traditional instruction and in online distance education. Finally, the relevant

literature relating to persistence and dropout of adults will be reviewed. The historical persistence and dropout research will be addressed, followed by a discussion of the literature specifically relating to persistence and dropout in online distance education. Emphasis will be placed on the studies that addressed student characteristics and demographic variables.

The literature reviewed for this study was obtained from a comprehensive search and gathering of writings and studies identified from a variety of sources. Physical searches of several academic journals were conducted, including *Adult Education Quarterly*; *The American Journal of Distance Education*; *Information, Communication, and Society*; *The Journal of Asynchronous Learning Networks*; *Technology in Higher Education Journal*; *The Journal of Higher Education*; *The Journal of Research on Computing in Higher Education*; and *Community College Journal of Research and Practice*.

An extensive search of electronic resources was also conducted using the state of Georgia's GALILEO (Georgia Libraries and Learning On-Line) system to search several databases, including EBSCO, ERIC, and Dissertation Abstracts. The popular Internet Search Engine *Google*TM has launched an experimental academic search engine, *Google Scholar*TM, which was used as well. Resources discovered through these various searches included numerous journal articles, published and unpublished dissertations and manuscripts, and books. The electronic searches were conducted using the following descriptors: distance education, online distance education, web-based distance education, online learning, persistence, and dropout. Additional searches were conducted using specific student characteristics, including age, gender, race, ethnicity, socioeconomic status, financial aid, and population density.

The Evolution of Distance Education

Today's online distance education courses are products of not only technological advances, but of a rich and extensive history of innovation as well. It is difficult to determine exactly when the concept of learning at a distance first appeared. Because the purpose of the written word was to convey ideas and information to others at later places or times, distance learning could ultimately be traced back to the first humans to utilize recorded symbols or words. Throughout history, the evolution of distance education has paralleled the communications technologies available to society at any given time (Picciano, 2001). The magnitude and character of distance education have grown with the emergence of new means of communicating. For the purposes of this study, distance education will be traced from its formal beginnings in the mid nineteenth century.

The development of reliable postal systems and the increase in adult literacy in the 1830s led to the rise of numerous correspondence courses in Germany, Sweden, and Great Britain (Holmberg, 1986). Isaac Pitman's introductory shorthand correspondence courses attracted a significant following in Great Britain in 1840 (Picciano, 2001). The British continued their efforts at distance education by extending university instruction to include several popular lecture series in the late 1850s at Oxford and Cambridge (Watkins & Wright, 1991). One of the lecturers at Cambridge during this time, James Stuart, developed several innovative instructional elements, including printed syllabi, written assignments, and remotely administered exams (Portman, 1978). These elements were rapidly adopted as key components in university extension and what was later to become correspondence study.

During the last twenty-five years of the nineteenth century, the British concept of university extension spread throughout Europe, Australia, and the United States. Among the

successful American universities to adopt correspondence studies were the Chautauqua College of Liberal Arts in New York, the University of Chicago, Illinois Wesleyan, the University of Wisconsin, and Pennsylvania State University (Picciano, 2001). During this period of expansion and innovation, however, several problems emerged that would continue to plague distance educators for years to come—seriously inadequate funding, lack of support from university administration, and reluctance of faculty to embrace the new methods (Woytanowitz, 1974). These issues, along with a lack of qualified lecturers due to increased on-campus enrollments led to a brief demise of correspondence programs for several years around the turn of the century (Watkins & Wright, 1991).

In 1905, while still struggling to recover, distance education in universities encountered its first serious external threat—competition. Several proprietary schools began to offer correspondence courses to fill the niche vacated by the universities and were doing extremely well. In Wisconsin alone, 35,000 students enrolled in private correspondence courses and paid over \$800,000 in tuition (Watkins & Wright, 1991). Faced with such a significant loss of potential revenue, universities once again allocated resources to correspondence courses, and the resurgence of American distance education soon followed. By 1908, correspondence study was expanding again, to the extent that some suggested a new dual role of the university—to bring about both social and technological change, and to help citizens adjust to those changes (Watkins & Wright, 1991).

In 1915, a national Conference on University Extension was organized at the University of Wisconsin. In stark contrast to previous, smaller scale meetings held in previous years, the attendees were predominantly well-respected academic professionals—administrators and professors. The primary purpose of the conference was to establish the National University

Extension Association (NUEA), an organization which would form a model of distance education that has influenced education in America ever since (Woytanowitz, 1974). Under a common theme of service, five key aspects of distance education were identified. The use of off-campus lectures, correspondence courses via postal communication, traditional university classes held at off-campus locations, agricultural extension, and general service to society were all considered important and viable methods of serving and instructing the population (Woytanowitz, 1974).

Many have described the fact that distance education and the modern university both appeared simultaneously (Birnbaum, 2001; Keegan, 1996; Moore & Kearsley, 2005; Watkins & Wright, 1991). This was due in part because the pioneers of distance education had a tremendous impact on the shaping of the university in the early twentieth century. Even so, there was often conflict between the two. Academic leaders in the universities realized that they had obligations and responsibilities to society, and that they needed to avoid being perceived as elitist. Distance education helped in that sense, but it also placed a tremendous strain on the already limited resources of the universities.

From a technology standpoint, the early years of the twentieth century saw the first use of visual instruction, with the use of lantern slides and motion pictures (Watkins & Wright, 1991). Motion picture technology made its way into many universities between 1910 and 1920, but the cost of producing, acquiring, and even displaying films was prohibitive, so the technology was not used extensively. Instructional technology made its first real appearance on the distance education scene in the 1920s with the wide availability and acceptance of radio. It has been estimated that radio stations were created by at least 176 educational institutions during the 1920s in order to deliver distance education programming (Buckland & Dye, 1991). By the

1940s, 202 colleges, universities, and other schools had been granted broadcasting licenses by the federal government. During the 1930s, the American radio audience was estimated at more than thirty million (Watkins & Wright, 1991). The popularity and almost universal availability of radio led some distance educators to argue that instructional radio would “radically transform American higher education” (Pittman, 1986), but despite the high hopes of many, instructional radio lost momentum in the early 1940s, when only one college credit course was offered (Watkins & Wright, 1991).

The demise of instructional radio was due largely to the lingering economic effects of the Great Depression and the entry of the United States in World War II. Very little progress was made in the delivery of distance education during the war, but afterward, in 1945, a new generation of educators emerged, bringing with them a renewed vision of what distance education could become (Wright, 1991). Correspondence study was addressed with a new vigor, with the convening of several national conferences, a national newsletter, and the exploration of the use of the latest communications development, the television, as a means of supporting and enhancing distance education (Wright, 1991).

In 1956, the NUEA formed a separate division tasked with the examination of the practicality of television technology in distance education courses. Early research concluded that television broadcasts were highly effective when used in conjunction with correspondence study. By the late 1950s, both open and closed circuit television broadcasts were widely used in American universities, along with the projection of kinescopes, or films made from television images (Picciano, 2001).

Two commercial television networks, the National Broadcasting Company (NBC) and the Columbia Broadcasting System (CBS), offered limited developmental and broadcast

assistance to New York University and Johns Hopkins University in 1958. In the 1970s, the Public Broadcasting Service (PBS) began a new era in educational television with the power of a network of affiliates across the nation, and continues to be the leader in educational television programming and broadcasting (Picciano, 2001).

The 1970s also witnessed the rise of more advanced television technology with the development of cable television (CATV) and satellite television communications. Throughout the decade and into the 1980s, television technology continued to evolve. One-way broadcasts were still widely used as a medium for the delivery of educational content, but two-way, interactive television communication, or videoconferencing, dramatically changed the face of distance education in the late 1980s.

Videoconferencing, enabled by satellite, high-speed telephone lines or fiber optics, was able to provide full-motion video signals from two or more sites, along with real-time voice and graphic communication. This technology allowed the first truly interactive distance education delivery system, as students and instructors were able to see and hear what was taking place at each site connected to the network, and were able to respond and get feedback instantly. Because of the extensive costs of the equipment and connection time related to videoconferencing, few educational institutions were able to individually fund significant distance education networks. Most realized that there was financial strength in numbers, and pooled their resources into establishing distance learning consortia.

Among the larger of these videoconferencing consortia were the Iowa Communications Network (ICN) (Picciano, 2001), and the Georgia Statewide Academic and Medical System (GSAMS) (Moore & Kearsley, 2005). The ICN is still widely utilized and thriving, and remains one of the largest videoconferencing networks in the United States. The GSAMS network was

among the world's largest videoconferencing consortia at its peak of use in the late 1990s, but has decreased in size in recent years due in part to a lack of continued funding. Declines in the use of videoconferencing technology were not only prompted by budgetary issues, but by the development of an even more advanced technology.

At about the same time that videoconferencing was becoming the delivery method of choice for distance educators, the personal computer was also playing a role in the evolution of distance education. Since the early 1980s, computer-based training (CBT) was widely used in many postsecondary educational institutions. With advances in computing power, speed, and multimedia capabilities, CBT quickly transformed from basic, programmed learning modules into interactive, adaptive educational tools (Dede, 1996). Educational software became commonplace and was widely utilized to supplement distance education programs, but it still could not overcome the critical barrier that videoconferencing had managed to surmount—interactivity. In the mid 1990s, that barrier was shattered.

The World Wide Web (WWW) was developed as an unrestricted component of the Internet in 1991 by Tim Berners-Lee. This powerful network of computers and access protocols gained immense popularity in just a few years, and soon provided anyone with access to a personal computer and a phone line a means of connecting to millions of other computers around the world. This new medium allowed almost instant text, audio, and video communication among users connected to the vast network. By 1995, online distance education was well-established and growing exponentially.

The WWW provided a level of interactivity that even videoconferencing could not match. Not only could online distance education provide real time interaction and feedback, but it could provide it at any time. Learners were no longer bound by telecast schedules and

facilities. This asynchronous feature of online distance education would prove to be the attribute that made it most appealing to adult learners.

Although correspondence courses, video conferencing, and traditional computer based training are still legitimate methods of providing content in distance education, they are now the exception rather than the norm. Students in online distance education courses are able to access their course materials from practically any location with access to the WWW. Instant access to course documents, presentations, electronic mail, discussions, audio and even video make online distance education the powerful medium that it has become in recent years (Connick, 1999; Lynch, 2001). Even videoconferencing is beginning to migrate to an online format, with real-time teleconferences taking place on individual computers rather than in expensive conferencing rooms.

Theories of Distance Education

Comparisons have been made between distance education and the industrial manufacturing process. In particular, in 1967 Peters proposed that the standardization and centralization features of distance education make it a good fit with industrial society, and that its success is due in part to its ability to evolve in parallel to changes in technology (Peters, 1994).

A theory of independent learning and teaching was developed by Moore (1986). Moore's theory involves two distinct dimensions, learner autonomy and transactional distance. Moore contends that because of the geographical and psychological distance that exists between instructor and learner, a communications gap results. Moore considers this gap to be a potential source of misunderstanding and confusion, and refers to it as transactional distance. Moore does not suggest abandoning other theories of traditional education, and agrees that much of the existing knowledge about teaching and learning can be transferred to the study of distance

education. He does, however, argue that the transactional distance requires special consideration, and calls for innovation in dealing with the unique requirements of learners at a distance. Learner autonomy, according to Moore, is an ideal characterized by maintaining a degree of control of the learning process, and is affected by the extent of the transactional distance.

Holmberg (1995) postulates a theory to describe teaching in distance education, one which addresses the personalization of the teaching process at a distance. He describes communication between a teacher and a learner at distant locations as “non-contiguous communication” (p. 1), different from face-to-face communication, but equally important. Because of his belief that learner motivation requires a personal relationship, Holmberg maintains that personalized communication must be of utmost concern in teaching at a distance.

Keegan (1996) proposes a theory of distance education that is based on the separation, in both time and location, of the acts of teaching and learning. Because of this separation, Keegan contends that widely accepted general education theory is a good foundation for understanding distance education, but that traditional theories related to oral, group-based instruction are inappropriate because of the personalized nature of distance education. The communication that results in distance education settings is unlike that of the traditional classroom, Keegan maintains, so the focus of study should be on the fostering of planned, personalized communication. The goal, according to Keegan, is to reintegrate the acts of teaching and learning (1996).

Garrison (1989) proposes a theory of communication and learner control “based upon seeking understanding and knowledge through dialogue and debate” (p. 12). Rather than focus on the learner as the controller of the learning process, Garrison addresses the interaction of the learner with a teacher. Because of the distance involved, Garrison argues that technology is

necessary to facilitate this interaction, making technology inseparable from distance education. He suggests that with continued technological advances, distance education will move beyond the industrial characteristics identified earlier by Peters.

The features of distance education that make it unique, the separation of teacher and learner by time and location, are central to all these theories of distance education. Because of this separation, distance education theory tends to focus on the interactions that take place not only between teacher and learner, but among learners as well.

What appears to be lacking in the existing theories is an acknowledgement of the evolving economic and social contexts which are driving much of the growth in distance education. The rapid expansion of knowledge is creating a much greater need for postsecondary education, both academic and vocational. The concept of lifelong learning must be embraced by individuals and businesses if they are to ensure their professional survival. Distance education is poised to be the method of choice for delivering much of that knowledge.

Philosophy of Online Distance Education

Adapting learning theory to online distance education is a major concern for many educators (Keegan, 2000). Changes in technology have occurred so rapidly, and capabilities have grown so exponentially, that the advent of online distance education is unlike anything the field of education has seen before. Keegan (2000) explains:

One hesitates to use the term “a paradigm shift” of the arrival of yet another new technology in a field where it has been frequently used of false dawns and Jerusalems still to come. For distance training institutions and their staff, nonetheless, there are serious challenges in the developments of training on the web. For the first time in the history of distance training, staff will be confronted with training provision for which a

recent BSc in computing is more valuable than a degree or diploma in education and training. *This* is a paradigm shift. (p. 117)

As distance education continues to evolve, distance education theorists continue to refine their definition of the field. Numerous theorists have attempted to define distance education over the years, but the most widely accepted is that proposed by Keegan originally in 1986 (Keegan, 1986), and modified in 1996 (Keegan, 1996). In his definition, Keegan describes five key characteristics of distance education. According to Keegan (1996), distance education is first characterized by the separation of the learner and the instructor for the duration of the learning process. Second, he identifies the role of an educational organization in planning, preparing, and delivering materials and content, and in providing support services to students. Keegan's third characteristic of distance education is its use of technical media to deliver the course content and connect the learner and the instructor. Technical media can consist of print media, audio, video, or computer-delivered media. The fourth characteristic, according to Keegan, is that two-way communication initiated by either instructor or student is a vital component of distance education. Keegan's fifth characteristic of distance education is that it consists of an environment in which learners are primarily self-directed, and are generally taught as individuals rather than groups. He mentions that opportunities for group interaction are possible, both in face-to-face settings and through electronic means. Keegan's definition appears to be broad enough to accommodate the development of online distance education, and has survived largely intact through several years of scrutiny by researchers and theorists in the field.

With this definition in mind, the most basic philosophical underpinning of online distance education is that it is not seen as a replacement for traditional, face-to-face instruction, but as a viable alternative. A call for the development of a theoretical framework for distance education

was made thirty years ago (Moore, 1973), and that call has largely gone unanswered. Several attempts have been made to do so, but theorists differ significantly in their approaches to studying distance education. While a single, widely-accepted theoretical framework for distance education is still elusive (Keegan, 1996), several perspectives have gained prominence.

It has been suggested that future efforts to develop theory in distance education place a decreasing emphasis on its nontraditional aspects such as distance and separation and instead focus more on the learner (Amundsen, 1993). Childs (1957), a pioneer of the 1950s distance education movement, predicted the future of nontraditional forms of education when he said “Individuals and groups are increasingly approaching our campuses to ask what we can do to meet their educational needs which cannot be met by daytime classroom instruction” (Childs, 1957). Such a statement is just as real today as it was in 1957. Just as distance education provided solutions to those needs for the next several decades, it will continue to do so in the years to come. In addition to the philosophical underpinnings of distance education, it is also necessary to understand who participates and why. A brief review of the adult education participation literature follows.

Participation in Adult Education

Adult education has been described as a “large and amorphous field of practice, with no neat boundaries such as age...or mission” (Merriam & Caffarella, 1999). Because of the wide variety of participants, purposes, subjects of study, and methods of delivery, it is difficult to describe the field in simple terms. The study of participation in adult education is one method of forming an understanding of the field. Because participation by adults in educational activities is for the most part voluntary (Merriam & Caffarella, 1999), it is important for educators of adults to understand why some choose to participate, why others do not, and what can be done to foster

higher levels of participation. As Houle (1961) described it, “the desire to learn, like every other human characteristic, is not shared equally by everyone” (p. 3). Houle did, however, note that human nature gives everyone at least *some* desire to learn.

Merriam and Caffarella (1999) report that the most commonly given reasons for participation in adult education activities are related to employment, with learners either participating in order to gain employment, or to advance in status or position in an existing job. Aslanian and Brickell (1980) studied the influence of life transitions on adult learner motivation. Of the learners they sampled, 83% identified an event or change in their lives, either past, present, or future, as a major reason for participating in adult education activities. The authors categorized the learners’ transition events into seven types, of which employment-related events comprised 56%. Events related to learner’s families were responsible for 16% of the transitions. Other transitions identified by the learners were leisure, art, health, religion, and citizenship.

Motivational Orientations of Adult Learners

A common approach to determining why adults choose to participate is to simply ask them, as numerous studies have done. Perhaps one of the most well-known studies of this type was reported by Houle (1961) in his classic work, *The Inquiring Mind*. In this study, Houle interviewed 22 adult learners, all of whom were identified by others as actively involved in learning. These adults were from diverse family and educational backgrounds. In detailed interviews with the individuals, Houle sought to determine their perceptions of being adult learners and the reasons for their continued learning. Following the interviews, Houle came to the conclusion that all the learners had similarities. They all expressed the desire to achieve educational goals, they all seemed to enjoy the learning process, and they all considered learning to be a worthwhile activity. The learners did differ significantly, however, in the way that they

perceived themselves as adult learners. Houle surmised that the responses could be divided into three categories, each based on a distinct difference in the way the individuals perceive themselves. Houle's typology includes goal-oriented, activity-oriented, and learning-oriented learners.

Goal-oriented learners, according to Houle, have very clear-cut objectives in mind, and use education as a means to accomplish them. They see themselves and others as goal seekers, and typically participate in learning activities as a result of some life incident or event. The goals pursued are often, but not always, related to career change or advancement. Goal-oriented learners realize that they have a need of some type, recognize that they want to meet that need, and then realize that they *can* meet that need.

Houle describes activity-based learners as those whose primary reasons for participating in learning activities are not related to the purposes of the activities in which they participate. The reasons given for participation by activity-based learners are many and varied, with some common ones being to socialize or meet people, to seek a marriage partner, to escape personal problems or bad relationships, or to carry on family or cultural traditions of engaging in educational activities. Some learners, according to Houle, "have been engaged in education so long and to such an extent that it has become an essentially meaningless activity" (Houle, p. 22).

The third type of learner that Houle describes is the learning-oriented learner. For this type of learner, learning is a constant activity and a way of life, a process that is good in and of itself. The purpose of learning for those in this category is simply the desire to know. The learning-oriented adult may have difficulty in separating education from other aspects of life, because the two are so intertwined.

Houle concedes that for most active adults, their learning characteristics and tendencies would fit into one of the three categories, but agrees that having characteristics of multiple categories is not only possible, but likely. He also emphasizes that none of the three categories is considered better or worse than the others, and that his three-orientation system would be unlikely to work for those who participate less extensively in adult education activities.

Houle identifies five influences that appear to be common to all active learners, regardless of category. Family relationships, prior formal education, use of public libraries, occupation, and the educational participation of friends were all described as having some type of effect on the decision to participate.

Sheffield (1964) took Houle's work further by increasing the extensiveness of the questionnaires and using them with attendees at numerous adult education conferences. His findings support Houle's three-part typology, but he suggests a need for dividing two of the types into subtypes. Sheffield adds "personal goal" and "societal goal" under Houle's goal-oriented learning type, and "desire for sociability" and "need fulfillment" under Houle's activity-oriented learning type (p. 9). Sheffield's study also found a significant positive correlation between two orientations, "learning" and "personal goal" and the degree of participation in adult education activities. This finding allows, to some degree, adult education participation to be used as an index of the presence of these two orientation types.

Boshier (1982) developed an *Education Participation Scale* based on Houle's typology of adult learning. Boshier sought to test the applicability of Houle's typology to the assessment of learner motivation, and developed an instrument that measured motivational orientations along six factors: social contact, social stimulation, professional advancement, community

service, external expectations, and cognitive interest. The Education Participation Scale is widely used in studies addressing participation and motivation.

Although the study of motivation in adult learners has traditionally considered motivation itself to be a reflection of an innate yearning for self improvement or a reaction to external forces, there are some who disagree. Ahl (2006), for example, recently proposed that what is often assumed to be a lack of motivation is in fact simply a lack of interest, and that those identified in many studies as having motivational problems are being marginalized by researchers and theorists who label them as unmotivated. She argues that the emphasis placed on understanding motivation by Western researchers is misguided because it tends to emphasize differences that she sees as insignificant and created by those who exert power. Ahl contends that a total lack of interest in education should not be construed as atypical or inferior, but perfectly normal.

The study of motivation among adult learners has attempted to explain what factors or variables create in them a desire to participate in educational activities. These factors are often described as intrinsic, and stem from innate aspirations of humans to better themselves. Examples of intrinsic factors are self esteem and companionship. Motivation has also been associated with extrinsic factors, such as finding employment or advancing in a career, or to meeting what are perceived to be societal expectations.

Barriers to Participation

Simply knowing why some adults choose to participate in organized adult education gives us no information about why others choose not to participate. For that reason, much research has been conducted in an attempt to determine why more adults do not participate. Merriam and Caffarella (1999) report that the most common reasons adults give for not

participating are lack of time, lack of money, and family responsibilities. Johnstone and Rivera (1965) used cluster analysis to group barriers to participation into two groups—external (situational) barriers and internal (dispositional) barriers. External barriers were described as being those that lie beyond the control of the learner, such as location or cost of educational activities, while internal barriers were considered to be those related to personal beliefs and attitudes. Internal barriers include such things as fear of failure and considering oneself not deserving of the benefits of education. Cross (1981) includes a third category of barriers, one she calls institutional barriers. This category includes any barriers that prevent or discourage adult learners from participating in organized educational activities. Examples of institutional barriers are inconvenient course scheduling and inefficient registration processes.

Darkenwald and Valentine (1985) used factor analysis to identify six factors of nonparticipation, (a) lack of confidence, (b) lack of course relevance, (c) time constraints, (d) low personal priority, (e) cost, and (f) personal problems or issues. The researchers later developed a typology of adult nonparticipants in another analysis of the same data (Valentine & Darkenwald, 1990). This typology included five orientations of nonparticipants, in which adults are deterred from participating by personal problems, lack of confidence, educational costs, a general lack of interest in organized education, or a lack of interest in available courses.

Other researchers (Boshier, 1973; Garrison, 1987; Miller, 1967; Rubenson, 1986) have addressed deterrents to participation from psychological, social, and sociological perspectives, and identified such deterrents as pre-adult factors, lack of support systems, race, gender, class, power, authority, and control (Merriam & Caffarella, 1999). The various perspectives used to explain nonparticipation suggest that varying interventions be implemented if participation is to be increased. If addressed from a standpoint of individual interests and motivation, then

motivational efforts could be directed at meeting the perceived needs of the learner. If addressed from the standpoint of societal structure issues, then efforts would be focused on bringing about a change in society to create higher levels of participation.

Explaining and Predicting Participation

Miller (1967) expounded on the work of earlier researchers in an attempt to explain why class (defined by socioeconomic status) is linked to adult education participation. Miller based his work on the theoretical development of Maslow's hierarchy of needs, Lewin's dynamic theory of force field, and Warner and Gans' social class theories. Miller's efforts were concerned "with making tentative predictions about future trends in participation" and "developing plans for increasing participation in desirable educational activities" (p. 2).

Like Houle's goal-oriented learning orientation, Miller's work asserts that active learners are acting on some personal need to do so, but that the needs of the learner are not static. Personal needs, according to Miller, are shaped by the social structures and forces of the learner's environment. In that light, individuals with identical personal needs may have to perform differently in order to meet those needs, based on the norms and expectations of their particular culture. Miller further asserts that patterns exist between the variables of personal needs and social forces, such that "any particular pattern will generally result in the same level of participation" (p. 4). The personal needs are closely tied to Maslow's (1954) hierarchy of needs, and the social variables are linked to the influence of social class on participation in adult education. Miller diagrammed each of his patterns, graphically demonstrating the effect of various competing forces in motivating adult learners from different social classes to participate in several types of adult education—education for vocational competence, for personal and family competence, for citizenship competence, and for self-development. In all cases, personal

needs are considered motivators. Social forces, in contrast, can be either motivators or barriers, depending on the particular social class involved. Each of Miller's diagrams charts both positive and negative forces and their relative strengths. This dynamic relationship between the competing forces is Miller's concept of force-field analysis.

Boshier (1973) also explains participation as being affected by the interaction of social and personal factors. His congruency model explains dropout from adult education institutions by assuming that participation and persistence are determined by learners' own perceptions of themselves and how well those perceptions match the educational environment.

Darkenwald and Merriam (1982) propose a model emphasizing psychosocial interaction between individuals and environmental forces. This model addresses two life stages, preadulthood and adulthood, and socioeconomic status. In the preadulthood stage, intelligence and socioeconomic status shape the education and socialization during maturity, and adult socioeconomic status is seen as a direct result of the preadulthood condition. Other components of the adulthood phase are the degree of need for further learning, perceived value and utility of further education, readiness to participate, participation stimuli, and barriers.

Henry and Basile (1994) suggest a model incorporating motivational factors and deterrents to participation to help explain the decisions of adults about whether to participate in formal adult education. In their model, several factors are taken into account, including age, gender, race, education, occupation, course attributes, and institutional reputation.

Cross (1981) proposes that participation in learning is a result of a series of responses to psychological as well as environmental factors. She formed a model which sought to identify all relevant variables and form hypotheses regarding their relationships. In addition to the situational

and dispositional barriers identified by others, Cross includes a third category, institutional barriers. Cross' model was the first to include life events and transitions.

None of the existing theories of participation and motivation focus specifically or exclusively on adult education activities involving distance education, but no reasons were proposed or found which conclude that they cannot be applied in the distance education environment. Regardless of whether adults attend class in traditional, face-to-face settings or in the virtual world of an online course, many of the same factors that motivate or deter may still be involved in the decision about whether or not to take part.

Participation in Online Distance Education Courses

Some key features of distance education, specifically online distance education, may actually help to remove barriers to participation. The barriers of distance and time, so often reported by many adult learners, can be removed with online courses, which allow for participation at any time, from any place. Those adults who are reluctant to participate in traditional educational activities because of social fear or anxiety may feel more at ease with the online environment.

Conversely, the very features that remove barriers for some may actually create them for others. The online educational setting may be too far removed from the highly social setting of traditional classrooms, and some learners may not be willing to commit to spending so much time physically isolated from others in order to participate online.

The technology involved in online participation may also serve as a deterrent. The Internet and personal computers have made online educational activities possible, but to those who have not learned to utilize this technology, or who use it but are uncomfortable or afraid of it, online courses may appear too frightening to attempt (Rubenson, 1986).

A common thread among those who express a reluctance to engage in online distance education is the lack of interaction, both with the instructor and with other learners. A study by Zielinski (2000) found that when offered several options for course delivery, 90% of learners in a corporate technology setting chose traditional face-to-face instruction over online instruction.

Perdue and Valentine (2001), in a study of Certified Public Accountants, found that among the members of their sample most believe Web-based training to be an effective method of learning, have access to the technology needed to participate in the training, but typically choose not to do so. The researchers identify four broad elements of deterrence to participation in Web-based education. The two most significant are concerns about electronically mediated communication and concerns regarding the quality of the online course offerings. The other two are concerns involving access to technology-related resources and the availability of personnel resources.

The relative newness of the Internet as a medium for participating in educational activities may also serve as a deterrent. Online courses have only widely existed in the past few years, and questions and concerns about the validity and quality of these Web-based offerings are likely to deter some potential participants. One of the common concerns with online courses has been their high dropout rates, a problem which can best be understood by examining the literature related to adult learner persistence and dropout.

Persistence and Dropout among Adult Learners

The research related to persistence and dropout is well-documented and extensively cited in the literature, but two researchers in particular have contributed works which have shaped the foundations of persistence research. Although their research is not specific to adult learners, they are included here because of their classical models and because they are often referred to when

persistence and dropout are mentioned in the literature. Tinto's *Drop-Out from Higher Education* (1975) and Astin's (1975) *Preventing Students from Dropping Out* are seminal works which guided most of the persistence research that followed.

Tinto (1975; 1993) developed a three-stage "Model of Student Departure" through which students must pass in order to complete their program of study. The stages include separation, transition, and incorporation. The separation stage begins before enrollment, and includes pre-entry variables, including age, gender, ethnicity, educational background, and others. Tinto (1975; 1993) asserts that these factors influence a student's level of commitment and determine whether a student passes through the separation stage of his model (enrolls in college) and on to the next stages. "Separation" refers to a disassociation of sorts from various communities of which the student has been a part. These communities may include family, friends, churches, or other schools. The transition and incorporation stages of Tinto's model involve integrating academically and socially in the college environment and reinforcing goals and commitments. Students who successfully complete the transition stage, according to Tinto, have successfully adapted to the academic and social expectations of the college environment, but have not yet fully adopted the new norms and behaviors that will benefit them as they continue in college. Tinto's incorporation stage describes the full integration of the new norms and behavioral patterns of the college community.

The logical framework used in this study is based primarily on the separation stage of Tinto's model. Several preenrollment characteristics of students, including age, gender, ethnicity, socioeconomic status, and the population density of their county of residence will be examined.

Astin (1975) proposes a theory of involvement which suggests that students who are actively engaged and involved in college activities are more likely to persist, while those who are

not involved in college life are more likely to drop out. His model focuses on the behavior and motivation of students, and emphasizes the importance of keeping the educational focus on the student.

Persistence in higher education has been studied for more than 75 years (Braxton, 2000), but the majority of the research was conducted prior to 1970. Although most of the research on persistence and dropout focuses on factors other than student characteristics, conflicting findings often emerge when these characteristics are examined. Demographic variables have been identified as significant predictors of persistence in many studies, while other studies have ruled out demographic variables after accounting for other pre-enrollment variables (Gibson, 1990). With respect to adult learners, Boshier (1988) proposes that demographic factors account for less than 10% of the total variability in completion rate.

It has been suggested that due to the rapidly increasing diversity of today's undergraduate college student, a need exists for a reevaluation of the student demographic variables once understood to predict retention (Reason, 2003). Reason further states "As an increasing number of students from formerly underrepresented groups come to campus, the effects of race, gender, ethnicity, age, and other demographic variables will change" (p.187). The recent growth and proliferation of online distance education also suggests that the foundational research of student persistence and retention be readdressed to determine whether or not it still holds true for today's modern and diverse online learning environment.

Student Characteristics and Persistence

Age and Academic Persistence

Studies of relationships between age and academic persistence have typically focused on traditional age students in college or university settings (Blecher, Michael, & Hagedorn, 2002)

rather than older, nontraditional students who are enrolling in college later in life. The age of the learner is of particular importance in this study, as it seeks to determine whether nontraditional adult learners and traditional learners drop out of online courses similarly.

Distance education was developed for the purpose of providing access to coursework without having to be physically present on campus (Kerka, 1995). This feature alone makes distance education highly attractive for older students with family and job obligations. Moskal and Dziuban (2001) observe that in their studies the typical online student was older than the typical student in face-to-face courses. They found the average age of online students to be 30, while the average student age in on-campus courses was 24. While the flexibility of online courses makes education more accessible for nontraditional learners, they may not always feel as though they are “connected” with the school because of the distance. In a sense, adult learners are similar to minority students in that they often feel marginalized by institutions that have traditionally served a younger population (Tinto, 1993).

The effect of age on student persistence has been investigated by several researchers, often with conflicting findings. Blecher et al. (2002), in a review of the literature on age and its effects on persistence, propose that because of inconsistent findings no definitive conclusions can be made on whether they are related.

Tinto (1993) asserts that older students, because of their other responsibilities and obligations, are more likely to drop out. Fjortoft (1995) agrees, finding that older adults dropped out at higher rates than traditional students.

In contrast to the findings of Tinto and Fjortoft, Feldman (1993) found in his study that students older than 24 are less likely to drop out. Comings, Parrella, and Soricone (1999), agree, as they found that in a study of pre-GED students, those aged 30 or older persisted at a higher

rate. This discrepancy in findings suggests further research on the completion rates of younger, traditional students and their nontraditional classmates.

In distance education settings, Carr and Ledwith (1980) found some indications that age influenced dropout. Their data indicate that the youngest and oldest students are more likely to drop out, while those closest to the median age are more likely to persist. Other studies (Dominguez & Ridley, 1999; Wojciechowski & Palmer, 2005) have addressed persistence specifically in online distance education courses, and these typically indicate that older students are more likely to successfully complete online courses. These findings were echoed in a recent study of online community college students (Muse, 2003).

Still other researchers contend that little or no correlation exists between age and persistence among distance learners (Osborn, 2001; Wang & Newlin, 2002; Willging & Johnson, 2004). Although age has been studied numerous times as a possible predictor of dropout or persistence, the findings are far from clear. Most of these studies have examined students in traditional, face-to-face college or university settings. The few studies that have addressed online persistence have still primarily focused on colleges and universities rather than community or technical colleges. It is still unknown what effect age has on the dropout rate of those enrolled in online distance education courses at those institutions.

Gender and Academic Persistence

Gender is an important predictor variable to study in regard to persistence, as changing demographics and societal issues impact the enrollment trends of both male and female students. Freeman (2004) recently noted that among undergraduate college students in the United States, the percentage of female students increased from 42% to 56% between 1970 and 2001. Projections of those figures to the year 2013 indicate an increase to 57% (Gerald & Hussar,

2003). A portion of this increase is attributable to the availability of online learning programs. The number of females enrolled in online programs is steadily increasing (Furst-Bowe & Dittman, 2001). Moskal and Dziuban (2001) found that female students outnumbered male students three to one in their studies of university online learners. The distinct advantages of online distance education which make it appealing to adult learners in general also appeal specifically to women who struggle to balance their education with other responsibilities.

It has been noted that female students typically face more pressure from external sources than males (Astin, 1975; Magolda, 1990; Tinto, 1993). The demands of home and family are often cited as reasons for women dropping out of college, especially for married women. Astin (1975) argues that marriage has opposite effects on males and females; married women tend to drop out more, while married men tend to drop out less. Tinto (1993) disagrees, reporting that in spite of this external pressure, female students generally tended to exhibit higher persistence rates in college programs.

Several studies agree with Tinto's findings. In DuBrock's (2000, May) longitudinal study of almost 7,000 full-time university students, females persisted at a higher rate than males. Jun (2005) arrived at similar findings with his study of dropout among students enrolled in corporate online education courses. In his study more men were married than women, and the men were far more likely to drop out. Carr and Ledwith (1980) found that gender was related to dropout in distance education courses, but that its effects varied by program of study. They found that female students were more likely to complete courses in social sciences, math, and the arts while male students were more likely to complete science and technology courses. Another more recent study of science, math, and engineering majors also indicated higher persistence rates for female students (Fenske, Porter, & DuBrock, 2000). Elkins et al. (2000) conducted a study based

on Tinto's separation model with 411 first-year college students, but they found that female students were less likely to persist than their male classmates.

As with age and academic persistence, conflicting findings typify the research related to gender and persistence. Liu and Liu (2000) report that gender was not a significant predictor of retention in their study of commuter students in a community college setting. Some researchers assert that in spite of years of examination, no significant differences exist between the persistence rates of men and women (Baker & Velez, 1996). The current body of research has not been able to consistently demonstrate gender's effect on persistence. Studies that investigate gender and persistence in online settings are few, and none have been found that include all the predictor variables examined in this study.

Ethnicity and Academic Persistence

Studies of ethnicity and academic persistence have produced more consistent results than those that have addressed other student characteristics, and ethnicity is generally considered to be a significant factor in predicting academic persistence. Allen (1997, May) reports that minorities are less likely to persist than non minorities, although not all minorities have been studied equally. According to Tinto (Liu & Liu, 2000; 1993), practically every dropout study comparing students of different races or social classes has addressed black and Hispanic students. "For the most part, these studies support the contention that departure among black and Hispanic students, like that among white students, reflects both issues of social contact/congruence and academic performance" (p. 93).

The commonly reported exception to the trend of lower minority persistence relates to the persistence of Asian students. Liu and Liu (2000) report that European American students (including Asians) had significantly higher persistence rates than non European American

students, considered the minorities in that study. Other studies confirm Liu and Liu's findings (DuBrock, 2000, May; Feldman, 1993; Fenske et al., 2000; Leppel, 2002), citing ethnic minorities other than Asians consistently dropping out at higher rates than Caucasian students.

The author was unable to find any research specifically addressing possible relationships between ethnicity and online persistence, although issues related to ethnicity and technology that may impact online academic persistence are numerous. For example, minority students may not have readily available access to technology resources, and cultural and language barriers may adversely affect computer proficiency.

Financial Aid and Academic Persistence

Financial difficulties have long been associated with dropping out of education, and they appear to have an effect on persistence in online distance education as well. Several studies have indicated that the financial aid status of a student is often an effective predictor of dropout, with those receiving financial aid being more likely to persist and those without financial aid being more likely to drop out.

Perna (1998), in a review of the persistence literature, concluded that the receipt of financial aid has a greater effect than any other variable on academic persistence, but cautions that the significance is in part determined by the specifics of the financial aid program, such as types of aid, amounts received, and eligibility. Perna also notes that because of the wide variety of financial aid sources available and the combinations of aid that are possible (loans, grants, scholarships, tuition reimbursement, etc.), more research is needed to examine this issue in depth.

DuBrock's (2000, May) longitudinal study of nearly 7,000 freshman university students also found strong positive relationships between receipt of financial aid and academic persistence

in face-to-face courses, with those receiving financial aid during their second year being more than twice as likely to return for their third year of study than those receiving no assistance. This study also indicated a strong relationship between the amount of aid received and persistence, finding that the persistence rates increased proportionally with the amount of financial aid awarded. Schuh (2000) agrees, reporting that students receiving larger individual awards were more likely to persist than others receiving numerous smaller awards. This finding led to the suggestion that fewer, but larger, awards be made.

The receipt of financial aid appears to have a positive impact on the persistence of minority students. Somers et al, (1999, November) found a strong relationship between receipt of financial aid and persistence among African American students in a review of the National Postsecondary Student Aid Study (NPSAS) for 1996, while Lichtenstein's (2002, June) study of first-year freshman persistence found similar positive results for Hispanic students.

Most research on financial aid and academic persistence generally suggests positive relationships between financial aid awards and persisting, but few studies were found that examine financial aid along with other preenrollment student characteristics.

Morris, Wu, and Finnegan (2005) found that the availability of financial aid in combination with a student's locus of control had a significant effect on dropout prediction within a group of online general education students. Parker (1999) obtained similar results with her study of students enrolled in three community college online courses. Wiggam (2004) studied the effects of several student characteristics on persistence including age, gender, ethnicity, and suggests that additional research studies of student characteristics are needed to investigate relationships between these characteristics and academic persistence in courses delivered via emerging methods of delivery.

Summary

The phenomenal advances in technology and access to that technology in recent years have radically changed the face of distance education. Online courses make educational opportunities available to people and places that would otherwise be excluded. Because online distance education is still a relatively new phenomenon, there is still much to learn about those who participate, including why they participate, why they drop out, and what can be done to maximize the effectiveness of the online instructional delivery method.

It cannot be assumed that theory established in traditional face-to-face on-campus settings can be applied to the online learning environment. While much has been learned about motivation, persistence, and retention of adult learners in on-campus settings, the nature of online distance learning makes it a distinctive situation requiring specific research. The unique combination of technology and the separation of teacher and student create a virtual environment that is unlike any other in the realm of education.

Studies are appearing that have begun to address some of the persistence/retention issues related to online distance education, but much like the traditional persistence research, these too are typically focused on traditional age students in traditional four year colleges and universities. Online persistence research specifically addressing community college students is scarce, as is research specifically addressing technical college students in online courses.

The current literature addresses some of the predictor variables examined in this study, but not all of them have been examined, and none have studied them in combination as this study will do. This study will correct for that by examining a composite set of variables, some of which have been addressed individually and in various combinations by others, but in different ways. The variables addressed in this study include age, gender, ethnicity, financial aid, and the

population density of the students' county of residence. No studies have been found which address the population density variable. Also, to my knowledge, no one has conducted a large-scale population study of online distance learner course completion. All other studies found have used relatively small samples of larger population. Also, researchers have typically studied program or degree persistence rather than individual course completion, as this study will do.

The current body of knowledge has not adequately addressed the possible impact of preenrollment characteristics of adult learners on their completion rates in online technical college courses. This study will address this gap in the research by examining several variables, both individually and in combination, from a very large and diverse population of technical college students.

CHAPTER 3

METHODOLOGY

Introduction

This chapter describes the research design and methods that were utilized in this study. It also describes the population and variables investigated. It contains five major sections: a logical framework, data source, data preparation, data analysis, and limitations of the study.

The purpose of this exploratory study was to determine the influence of age, gender, ethnicity, and financial aid on completion rates for nontraditional adults participating in online technical college courses. The following three research questions guided this study:

1. To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?
2. To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?
3. To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?

Logical Framework

This study examined several preenrollment student characteristics and their possible relationship, individually or in combination, to successful completion of online technical college

courses. It also sought to determine whether there are differences in successful course completion rates between traditional students and nontraditional students. The general model of the study is depicted in Figure 1.

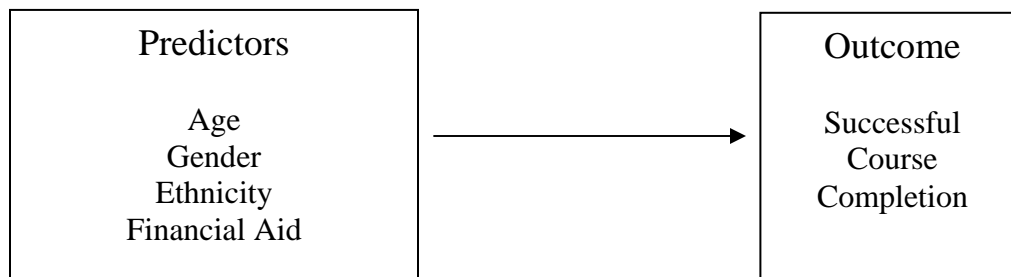


Figure1. *The General Model for the Method of Research*

Predictor Variables

Age

Age was selected as a predictor variable in order to create the three subsets within the population, traditional, transitional, and nontraditional. Nontraditional students, defined in this and other studies (Choy, 2002; Miglietti & Strange, 1998) as those 25 years of age and older, are more likely to have additional roles that they must assume in addition to that of “college student,” such as parent, spouse, employee, caregiver, and others. Traditional students, defined in this study as those between the ages of 17 and 21, may have additional responsibilities, but not typically as often or to the same degree as older students. This study classified those students aged 22-24 as transitional students, since they are not typically classified as nontraditional

students in the literature and are older than the traditional technical college student who enrolls immediately after graduation from high school. Most of the retention and persistence research has historically examined traditional students in four-year college or university settings. Few empirical studies have been conducted which examine persistence or retention among online students, and practically none have looked at online students in technical college courses.

The availability and convenience of online courses is appealing to a large number of adult learners, and has created an entirely new marketing audience for technical colleges.

Nontraditional students over age 25 make up 61% of the students enrolled in online courses offered through Georgia's technical colleges, and if these students are to be retained, research-based data is needed in order to better understand the factors that may contribute to the students' completing or dropping out of their online courses. Because of conflicting research findings in the traditional persistence literature and a lack of research in online persistence in general and technical college students specifically, age was selected as one of the predictor variables to be examined in this study.

Gender

Gender was also selected as a predictor variable for this study. The convenience and flexibility provided by online distance education are especially appealing to many adult women who are juggling work, family, and school responsibilities, and many report significant increases in their enrollment in online courses and programs (Furst-Bowe & Dittman, 2001; Gerald & Hussar, 2003; Moskal & Dziuban, 2001). As the research suggests, female students comprise a majority of the online student population examined in this study. Females made up 74% of the population of online students enrolled in online courses through GVTC.

With such a large percentage of the online student body being female, efforts to understand the unique characteristics of this group need to be made. Traditional research suggests that females are more likely to persist in traditional face-to-face courses (DuBrock, 2000, May; Tinto, 1993), but these findings are often contradicted by studies which find the opposite to be true or find no correlation at all between gender and persistence (Elkins et al., 2000; Liu & Liu, 2000).

The discrepancies found in the research suggest that the role of gender on persistence is not clearly defined. The existing research on gender's effect on persistence has typically addressed younger students in traditional four-year college and university courses, and research specifically addressing gender and online persistence, especially in technical colleges, is limited.

Ethnicity

The third predictor variable examined in this study is ethnicity, another variable that has been studied extensively in face-to-face settings with traditional-age students but rarely with online students. Research has historically asserted that with the possible exception of Asian students, minorities typically persist at lower rates than other students. No research has been found that looked at ethnicity as a predictor of dropout or persistence in online technical college courses.

The "digital divide," a name given to the often large gap that exists in terms of access to computers and other technology, is of concern to those engaged in administering online distance education. The digital divide can be considered an issue of social exclusion, as those without access to up-to-date technology or without the skills to effectively use technology are often at a disadvantage to those with access and skills. The digital divide does not clearly differentiate between the "haves" and the "have nots," so it is difficult to determine exactly who may be

effected by the phenomenon. What is widely acknowledged in terms of the digital divide is that minorities are more likely to be in the group without adequate access to the technology (Katsinas & Moeck, 2002). In an online distance education course, access to technology and considerable computer literacy and skills are requisites for success. Those without either or both may be more likely to drop out or fail. In a state where segregation in education was prevalent for many years and still exists in many places, we need to ensure that all students have equal opportunities for success. If other variables can be identified which may adversely impact the successful completion of online courses by minority students, interventions or alternative strategies may be made.

Financial Aid

The fourth predictor variable examined in this study is financial aid as determined by eligibility for Title IV federal student aid (Pell). Data directly describing student income is difficult, if not impossible, to obtain so this study used financial aid (Pell) eligibility as a surrogate for family income. Financial hardships have often been associated with dropping out of education, with research indicating that students who receive financial aid assistance are more likely to persist than those do not (DuBrock, 2000, May; Perna, 1998; Schuh, 2000).

The limited research that addresses receipt of financial aid as a possible predictor for persistence in online distance education tends to agree with the traditional research, finding positive relationships between receipt of aid and persistence (Morris, Wu, & Finnegan, 2005; Parker, 1999). Financial Aid is an important variable in this study because it is investigated in combination with other variables that have not been addressed together previously.

Outcome Variable

The outcome variable for this study is successful completion of an online course. Successful completion is defined in this study as finishing the course with a passing grade; specifically receiving a final course letter grade of “D” or higher. Although it is possible to use the final course grade of each student as the outcome measure, this study will consider all grades of “D” or higher as successful completion due to inherent problems associated with using students’ grades as measures of success. For example, institutions, departments, and individual instructors do not all grade consistently. Some give more high grades, others give more low grades, and some grade on a curve. Some courses and instructors are using pass/fail grading systems. Taking this into account, final course grades may be a function of the instructor rather than a measurement of academic performance. For most courses offered, a grade of “D” is the lowest grade for which course credit can be given.

Successful course completion is important to the technical colleges. The failure of a student to complete a course in which he or she enrolls is a problem for technical colleges for a variety of reasons. From a financial and personnel standpoint, scarce resources have been invested in training students who never finish their programs of study. Course dropout also has a significant impact on high-demand programs with restrictive admission requirements, as those who drop or fail to successfully complete their courses prevent others from enrolling. From a humanitarian perspective, failure to complete courses is not usually in the best interest of the student, and institutions have an obligation to help students succeed when possible.

The high rate of noncompletion among students enrolled in online courses is well documented. In order to efficiently examine the possible effects of student characteristics on

course completion, the outcome variable was defined as a dichotomous variable, with students either successfully completing the online course or not.

Data Source

This study was conducted using demographic data from students enrolled in credit courses during the academic year beginning July 2005 and ending June 2006 through the Georgia Virtual Technical College (GTVTC). GTVTC is an online consortium of the 34 technical colleges within the Georgia Department of Technical and Adult Education (DTAE). GTVTC serves as a central point of contact for all online credit courses and programs offered through DTAE, and standardizes many of the processes and procedures used by faculty and students in the delivery and participation of online distance education.

The data used in this study were extracted and compiled from the state's BANNER student information database by staff at the DTAE data center in Atlanta. Because of privacy issues related to The Family Education Right to Privacy Act (FERPA), permission to obtain and use the data was secured through the DTAE commissioner, and all personally identifying information was stripped from the data. Most of the data of interest in this study are demographic data that were collected from the students, typically at the time of application and registration. The information was either provided by the student on admissions applications or financial aid applications. Other data were gathered from Student Aid Report (SAR) that is sent to the student and to the institution. This document notifies the student and the school of federal Title IV (Pell) financial aid eligibility. All of these data are entered into the BANNER student information database at each DTAE institution, either by the student if forms are submitted electronically, or by support staff if paper forms are submitted. The remaining data in the set were entered into the BANNER system by individual course instructors in the form of student final grades.

The validity of the data set was explored through a personal discussion with the Coordinator of Information Services of the DTAE data center upon receipt of the data (personal communication, December 14, 2006). A follow-up discussion with the Director of the DTAE data center (personal communication, December 15, 2006) provided additional details about the quality of the data. In a study such as this one in which existing data are used, possible threats to validity include selection error and frame error. Selection error, such as the possibility of students being excluded from the study due to incomplete information, is addressed in the data preparation section below. In this data set, 2,351 cases were removed from the original 91,824, leaving a total of 89,473 cases. This missing data accounted for less than 3% of the total population, and is considered negligible considering the vast size of the data set. Frame error refers to the possibility that errors were made in accessing a sample from the target population. Since no sampling was conducted in this study, frame error was not a concern.

The data set contains demographic details and grades of students enrolled in online courses, and was collected from individual technical colleges through the agency's BANNER databases and housed at the data center in Atlanta. The accuracy of the data is assured provided it was entered correctly by the student on electronic applications or by technical college personnel. The data set was compiled based on the researcher's selection of personal characteristics identified in the agency's *Data Elements Manual*.

Accessing the Data

As I began formulating the theoretical model that I intended to use for this study, I began to contact people within the DTAE agency who had knowledge of the types of student data that were collected and what the logistics of accessing the data might entail. I knew from the early planning stages that I wanted to examine student demographic data, but I wasn't sure whether all

the variables I needed were available for all students. My initial list of desirable predictor variables was broad, again because of the uncertainty of the available data. I planned to use data on these variables for all the students enrolled in technical college courses through GVTC that claimed my technical college as the home school, a number estimated to be around 250 at the time.

After speaking with some DTAE office employees, I learned that the agency's data center in Atlanta produced a Data Elements Manual which described all the data that the agency collects and maintains. I requested a copy of the manual and upon receipt of it was able to compile a list of student characteristics for which data were available. From this publication I was able to initially expand my list of student characteristics, as more were available than I had originally included, such as high school attended, high school diploma, graduation date, previous postsecondary education, and GPA. Upon further investigation, however, I learned that while all these characteristics are included in the data set, data for each characteristic are not necessarily available for every student. For example, not all students have a high school diploma. Some have no previous postsecondary education, and first-time students have no established GPA. I discovered that data on age, gender, ethnicity, and financial aid eligibility are available for all students; these variables became the predictors for the theoretical model (see Figure 1).

Once I had the list of predictor variables that I intended to address, I started asking about how to access the data. I met with the registrar again at my technical college, who explained that our database administrator could write some scripts that would generate a report of the data that I needed. I asked about the location of the data, and learned that it was housed locally on campus, but was regularly uploaded to the DTAE data center, which compiled data from all 34 technical colleges. It was then that I realized that I could possibly obtain a data set for the entire GVTC

population rather than from one individual institution. I was put in touch with the Coordinator of Information Services at the data center, who became my point of contact for the rest of the data collection process.

I spoke with the Coordinator of Information Services for the DTAE data center by phone on several occasions to get an idea of what would be involved in gaining access to the data. I was told that because of a recent large volume of requests from other doctoral students, I would need to request the data in writing via email, which would then be forwarded to the DTAE commissioner for approval. Once approved, I signed a confidentiality agreement and was given the requested data.

The data used in the study consisted of two files. The first file was a *Microsoft Excel* spreadsheet which contained demographic information on each student enrolled in credit courses during the academic year beginning July 2005 and ending June 2006 through the GVTC. The second file was a delimited file that contained the course grades. The total population represented by the data set consists of 42,582 unique individuals. The unit of interest in this study is one student in one course, which in effect expanded the total population to 91,824 due to students enrolling in multiple courses during the year.

Student Demographic Information

No identifying information was used for students. Each individual was given a unique, randomly assigned identification number prior to my receiving the data set from DTAE. For each individual in the data set, information was available on school (coded by 3-digit school id), age (coded by age at the beginning of the term), gender (coded 1 if male, 2 if female), ethnicity (coded by ethnicity codes 1-7), Pell eligibility (coded as eligible or not), and completion status (coded as grade). Pell eligibility serves as a surrogate for family income.

Course Completion

The course grades earned by each student are reported in the data as letter grades, including A, B, C, D, and F, as well as I (incomplete), IP (in progress), S (satisfactory), U (unsatisfactory), W (withdrawn), WF (withdrawn failing), WP (withdrawn passing), AU (audit), Lab, TR (transfer) and EX (exempt). In order to clearly distinguish between successful completion and noncompletion, any grades of A, B, C, D, and S were considered to represent successful completion of the course. Grades of F, U, W, WF, and WP were considered to represent noncompletion of the course.

Data Preparation

Once the data were obtained, they had to be combined into a single usable file. The *Microsoft Excel* spreadsheet file containing the students and their demographic variables was imported directly into *SPSS 10.0*, a statistical software program. The resulting *SPSS* file was set up as a keyed table, or table lookup file, in order to merge the student data with the delimited file containing the course grades. These two files were merged into a single *SPSS* file containing all the data of interest to this study, which totaled 91,824 cases.

Once complete, this data set was examined for potential problems. In order to analyze the data effectively and to address the research questions fully, it was necessary to remove some of the cases from the original data set. This process involved several logical steps which will be further detailed in this section.

The next step in preparing the data was the removal of all cases for which no usable final course grade was recorded. This process involved the removal of cases with no grades listed, as well as those with grades that did not clearly indicate whether or not the student successfully

completed the course. Specifically, cases in which grades were listed as lab, audit, exempt, or transfer were removed from the data set. Cases in which grades of incomplete or in progress were assigned were also removed because it was not possible to determine whether the students completed the course requirements at a later time or not.

The next group of cases removed from the data set included all students younger than age 17. There were a small number of 15 and 16-year olds in the data set, and these were deleted since they did not fit into either the traditional or nontraditional student categories.

After removing all the cases described above, the resulting data set still contained over 97% of the total original population. There were 2,351 cases removed from the original 91,824, leaving a total of 89,473 usable cases. These data comprise the population of interest in this study.

Variable Recoding

Several variables were recoded into new variables in order to facilitate their analysis. The research questions call for a dichotomous outcome variable, so course completion needed to become dichotomized. In order to achieve this, a new variable, OUTCOME, was created from a recoding of the grade variable. Grades of A, B, C, D and S were assigned a value of 1, for successful completion of the course. Grades of F, U, W, WF, and WP were assigned a value of 0, for unsuccessful completion of the course.

The research questions seek to identify any differences in successful course completion rates between traditional and non traditional students, so recoding of the age variable was also necessary. Traditional students are defined in this study as those between the ages of 17 and 21 at the time of enrollment in the course. This classification is made based on the life role of these students, who are typically attending college immediately after high school and who have

minimal adult responsibilities. Nontraditional students are defined in this study as those who were 25 years of age and older at enrollment, a group which usually has significant adult responsibilities including family and full-time career obligations.

With this in mind, age was recoded into a new variable. A new variable, *age group*, was created from a recoding of the age variable into three values. Students with ages from 17-21 were assigned a value of 1, for traditional students. Students with ages from 22 to 24 were assigned a value of 2, for transitional students. Students aged 25 and older were assigned a value of 3, for nontraditional students.

An examination of the data on ethnicity revealed that black students and white students together accounted for 94% of the entire population, with the remainder consisting of Native Americans, Asians or Pacific Islanders, Hispanics, multi-racial students, and non-resident aliens. Because these ethnicities represented such a small segment of the population, any findings from an analysis of ethnicity using data on these students would be skewed by their small numbers. For this reason, they were grouped together and ethnicity was recoded into a new variable, *ethnicity dichotomized*, for use with some analyses. Students identified as Black were assigned a value of 1. Students identified as White were assigned a value of 2. All other students were considered missing data and were not assigned a new value in this variable.

Description of the Data Set

The population for this study consisted of students who enrolled in online courses offered through the Georgia Virtual Technical College during the academic year beginning July 2005 and ending June 2006 and earned a final course grade. Not included are those who audited courses, those given transfer or exemption credit, or those for whom it was not evident whether the course requirements were completed. The population was comprised of 89,473 cases, with

each case representing one student enrolled in one course. Some individuals are represented by multiple cases if they enrolled in more than one course. Selected characteristics of the full population are shown in Table 2.

Table 2. *Selected Characteristics of the Full Population (N=89,473)*

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Age Group:				
Traditional Students (17-21)	22,284	24.9	24.9	24.9
Transitional Students (22-24)	12,798	14.3	14.3	39.2
Nontraditional Students (25 and older)	54,391	60.8	60.8	100.0
Total N	89,473	100.0	100.0	
Gender:				
Male	23,462	26.2	26.2	26.2
Female	66,011	73.8	73.8	100.0
Total N	89,473	100.0	100.0	
Ethnicity:				
American Indian	269	.3	.3	.3
Asian/Pacific Islander	1,462	1.6	1.6	1.9
Black	34,203	38.2	38.2	40.2
Hispanic	1,720	1.9	1.9	42.1
White	49,867	55.7	55.7	97.8
Nonresident Alien	73	.1	.1	97.9
Multi-Racial	1,879	2.1	2.1	100.0
Total N	89,473	100.0	100.0	
Ethnicity Dichotomized:				
Black	34,203	38.2	40.7	40.7
White	49,867	55.7	59.3	100.0
Total N	84,070	94.0	100.0	
Missing	5,403	6.0		
Total	100.0	100.0		
Financial Aid:				
Yes (Pell Eligible)	35,531	39.7	39.7	39.7
No (Not Pell Eligible)	53,942	60.3	60.3	100.0
Total N	89,473	100.0	100.0	
Outcome:				
Non Completion	27,331	30.5	30.5	30.5
Successful Completion	62,142	69.5	69.5	100.0
Total N	89,473	100.0	100.0	

Table 3 is a frequency distribution of the number of courses taken by individual students in the population. Of the 41,702 individual students in the population, 20,238 (49 %) enrolled in only one online course. Another 9,977 enrolled in two courses, indicating that nearly 75% of the students in the population are represented in no more than two courses.

Table 3. *Frequency Distribution of Number of Courses Taken by Students*

Number of Courses Taken	Individual Student Count	Course Count
1	20,238	20,238
2	9,977	19,954
3	5,184	15,552
4	2,710	10,840
5	1,447	7,235
6	922	5,532
7	510	3,570
8	307	2,456
9	185	1,665
10	103	1,030
11	63	693
12	30	360
13	21	273
14	2	28
15	1	15
16	2	32
	41,702	89,473

Age was an important variable in this study. Students aged 17-21, classified as traditional students in this study, comprised 24.9% of the population. Transitional students, those aged 22-24, made up 14.3% of the population, while students aged 25 years and older, classified as nontraditional students in this study, made up 60.8% of the population. The mean age of the

students in the population was 29.6. Figure 2 shows the age distribution of the students in the population.

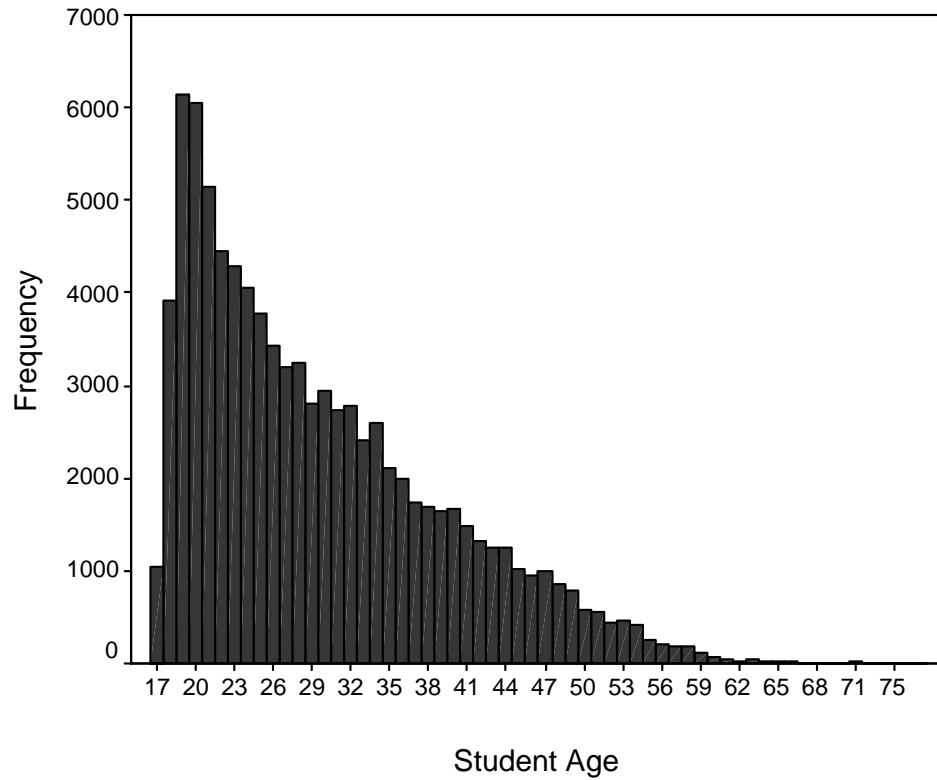


Figure 2. *Age Distribution of the Population*

This was a study of nontraditional students, so much of the data analysis in this study focused on the nontraditional students 25 years of age and older within the full population. Selected characteristics of the nontraditional students in the population are presented in Table 4.

Table 4. *Selected Characteristics of the Nontraditional Age Group (N=54,391)*

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Gender:				
Male	13,367	24.6	24.6	24.6
Female	41,024	75.4	75.4	100.0
Total N	54,391	100.0	100.0	
Ethnicity:				
American Indian	204	.4	.4	.4
Asian/Pacific Islander	824	1.5	1.5	1.9
Black	23,448	43.1	43.1	45.0
Hispanic	872	1.6	1.6	46.6
White	27,873	51.2	51.2	97.8
Nonresident Alien	31	.1	.1	97.9
Multi-Racial	1,139	2.1	2.1	100.0
Total N	54,391	100.0	100.0	
Ethnicity Dichotomized:				
Black	23,448	43.1	45.7	45.7
White	27,873	51.2	54.3	100.0
Total N	51,321	94.4	100.0	
Missing	3,070	5.6		
Total	100.0	100.0		
Financial Aid:				
Yes (Pell Eligible)	22,855	42.0	42.0	42.0
No (Not Pell Eligible)	31,536	58.0	58.0	100.0
Total N	54,391	100.0	100.0	
Outcome:				
Non Completion	14,501	26.7	26.7	26.7
Successful Completion	39,888	73.3	73.3	100.0
Total N	54,391	100.0	100.0	

The outcome variable for this study, successful course completion, is summarized in Figure 3. Successful course completers comprised 69.5% of the population, while 30.5% of the students did not successfully complete their course.

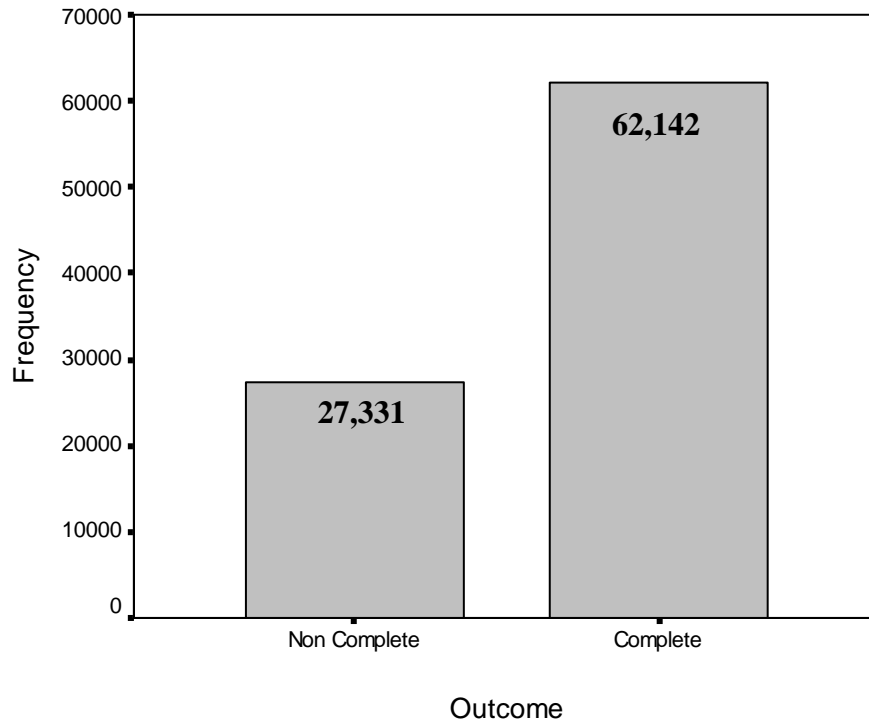


Figure 3. *Outcome Variable Distribution of the Population*

Data Analysis

In order to answer research question #1, (To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?) a Chi-square analysis was conducted to examine the various success rates for traditional and nontraditional students as measured by the *age group* variable.

In order to answer research question #2, (To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?) a series of bivariate analyses were conducted. The exact analyses were based on the level of measurement of the independent variable and the fact that the outcome variable was dichotomous. Consequently, an independent

t-test was used for the variable *age* because age is a continuous independent variable. Chi-square analyses were used for the variables *ethnicity dichotomized*, *gender*, and *Pell* because these independent variables are dichotomous.

In order to answer research question #3, (To what extent do personal characteristics jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?) a logistic regression analysis was conducted. Logistic regression is a procedure which can be used to predict the likelihood of a certain dichotomous outcome based on values of a set of predictor variables, but it also calculates odds ratios for each of the predictor variables. Logistic regression was used in this study to determine the possible combined effect of *age*, *gender*, *financial aid*, and *ethnicity* on successful online course completion.

Limitations of the Study

This study was based on a very large population of students enrolled in online courses in Georgia's technical college system. Although the data were from a population rather than from a sample, sample statistical analyses were conducted. This was done not to ensure that a sample was adequate, but in order to measure size of effect. No inferential statistics are necessary, so the findings are descriptive of the population without extrapolation.

Because the students in this population were all enrolled in technical college courses, the results of the study cannot be generalized to all online course populations. Discretion must be used with any generalizations.

The unit of measurement in the study is one student in one course. Some students in the population enrolled in multiple courses, so the total number of cases represents the number of courses taken rather than the number of students enrolled in the system. For example, if a student

enrolled in one online course, she would be included one time in the data. If she enrolled in three courses, she would be included three times. Because individual students may be included multiple times, the findings of the study may not hold true in a study in which students were counted only once. However, it should be noted that almost 75% of the students were not represented in more than two courses.

In terms of ethnicity, the population was predominantly black and white, with only 6% of the population consisting of other races. The ratio of minority students in the study population was disproportionately low when compared to the general population, especially for Hispanics and Asian-Americans. These minorities comprise a rapidly-increasing percentage of residents of the state of Georgia, and are underrepresented in the student population of Georgia's technical college system.

Finally, the predictor variables selected for inclusion in this study were selected based on both a review of the literature and an examination of the data that were available for all students enrolled in online courses in Georgia's technical college. I wanted to include variables that were consistently available in order to include the entire population in the study. Other variables could have been included, but doing so would have resulted in a much smaller number of cases since the variables were not available for everyone.

CHAPTER 4

FINDINGS

Introduction

The purpose of this exploratory study was to determine the influence of age, gender, ethnicity, and financial aid on successful completion rates for nontraditional adults participating in online technical college courses. Chapter 4 presents the results of the statistical analyses described in Chapter 3. The results of the analyses are presented as they relate to the following three research questions:

1. To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?
2. To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?
3. To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?

Findings Related to Research Question #1

The first research question asks, “To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?” In

order to answer this question, a Chi-square analysis was conducted to examine the success rates for traditional, transitional and nontraditional students as measured by the *age group* variable. The analysis revealed that traditional students aged 17-21 were significantly more likely to be noncompleters, while nontraditional students aged 25 and older were significantly more likely to successfully complete the online courses in which they were enrolled, $\chi^2(2, N = 89,473) = 1032.50, p < .001$. Details of the analysis are shown in Table 5.

Table 5. *Crosstab Descriptive Statistics for Age Group*

		OUTCOME			
			Non Complete	Complete	Total
Age Group	17-21	Observed	8433	13851	22284
		Expected	6807	15477	22284
		% within AGEGRP	37.8%	62.2%	100%
		% within OUTCOME	30.9%	22.3%	24.9%
		% of Total	9.4%	15.5%	24.9%
	22-24	Observed	4395	8403	12798
		Expected	3909.4	8888.6	1278
		% within AGEGRP	34.3%	65.7%	100%
		% within OUTCOME	16.1%	13.5%	14.3%
		% of Total	4.9%	9.4%	14.3%
	25 +	Observed	14503	39888	54391
		Expected	16614.6	37776.4	54391
		% within AGEGRP	26.7%	73.3%	100%
		% within OUTCOME	53.1%	64.2%	60.8%
		% of Total	16.2%	44.6%	60.8%
Total		Observed	27331	62142	89473
		Expected	27331	62142	89473
		% within AGEGRP	30.5%	69.5%	100%
		% within OUTCOME	100%	100%	100%
		% of Total	30.5%	69.5%	100%

Findings Related to Research Question #2

The second research question asks, “To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?” As stated in chapter 3, a series of bivariate analyses were conducted to determine the influence of each independent variable on successful online course completion.

Age

Because age is a continuous independent variable, an independent t-test was conducted to determine any influence of age on successful online course completion among the 54,391 nontraditional students in the data set. The analysis found that older students were significantly more likely to complete. The 39,888 successful course completers had a mean age of 35.77 (SD = 8.37), while the 14,503 students who did not successfully complete their courses had a mean age of 33.95 (SD = 7.89). These results demonstrated a significant difference at the 95% confidence level in completion rates, $t(54,389) = -22.8, p < .001$. The mean ages of the completers and noncompleters are shown in Figure 4.

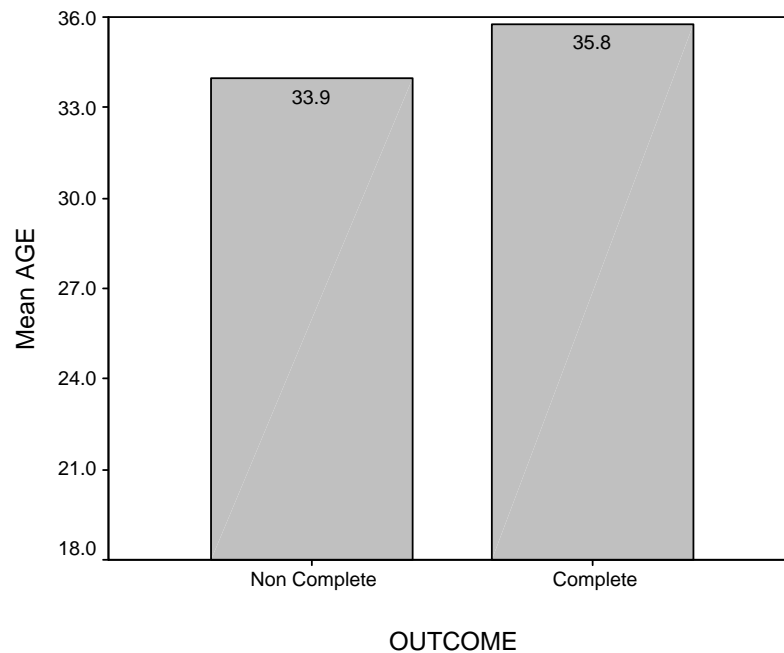


Figure 4. *Mean Age of Completers and Noncompleters*

Because the independent variables *gender*, *ethnicity dichotomized*, and *financial aid* are dichotomous, a series of Chi-Square analyses were conducted. The following sections describe the results of those analyses.

Gender

As described in chapter 3, females made up 73.8% of the online student population while 26.2% were male. Among the nontraditional students in the population, 75.4% of the students were female and 24.6% were male. Because gender is a dichotomous variable, a Chi-Square analysis was conducted. The analysis revealed no significant differences between the completion rates of male and female students.

$\chi^2(1, N = 54,391) = 1.360, p = .244$. Details of the analysis are shown in Table 6.

Table 6. *Crosstab Descriptive Statistics for Gender*

			OUTCOME		
			Non Complete	Complete	Total
GENDER	Male	Observed	3616	9751	13367
		Expected	3564.2	9802.8	13367
		% within GENDER	27.1%	72.9%	100%
		% within OUTCOME	24.9%	24.4%	24.6%
		% of Total	6.6%	17.9%	24.6%
	Female	Observed	10877	30137	41024
		Expected	10938.8	30085.2	41024
		% within GENDER	26.5%	73.5%	100%
		% within OUTCOME	75.1%	75.6%	75.4%
		% of Total	20.0%	55.4%	75.4%
Total		Observed	14503	39888	54391
		Expected	14503	39888	54391
		% within GENDER	26.7%	73.3%	100%
		% within OUTCOME	100%	100%	100%
		% of Total	26.7%	73.3%	100%

EthnicityDichotomized

As described in chapter 3, 94% of the population was comprised of black and white students, with only 6% represented by other minorities. Because of the relatively small numbers of other minorities present in the population, ethnicity was treated as a dichotomous variable and a Chi-Square analysis was conducted. The analysis revealed that white students were more likely to be completers, while black students were more likely to be noncompleters, $\chi^2(1, N = 51,321) = 1118.46, p < .001$. Details of the analysis are shown in Table 7.

Table 7. *Crosstab Descriptive Statistics for Ethnicity Dichotomized*

			OUTCOME		
			Non Complete	Complete	Total
ETHNDICH	Black	Observed	7971	15477	23448
		Expected	6298.2	17149.8	23448
		% within ETHNDICH	34.0%	66.0%	100%
		% within OUTCOME	57.8%	41.2%	45.7%
		% of Total	15.5%	30.2%	45.7%
	White	Observed	5814	22059	27873
		Expected	7486.8	20386.2	27873
		% within ETHNDICH	20.9%	79.1%	100%
		% within OUTCOME	42.2%	58.8%	54.3%
		% of Total	11.3%	43.0%	54.3%
Total		Observed	13785	37536	51321
		Expected	13785	37536	51321
		% within ETHNDICH	26.9%	73.1%	100%
		% within OUTCOME	100%	100%	100%
		% of Total	26.9%	73.1%	100%

Financial Aid

Eligibility for Pell grants was used in this study as a surrogate for family income, and comprises the *financial aid* variable. Pell eligibility is a dichotomous variable, so a Chi-Square analysis was conducted. The analysis revealed that students eligible for Pell were significantly less likely to be completers, while those who were not eligible to receive Pell grants were significantly more likely to be completers, $\chi^2(1, N = 54,391) = 516.49, p < .001$. Details of the analysis are shown in Table 8.

Table 8. *Crosstab Descriptive Statistics for Financial Aid*

			OUTCOME		
			Non Complete	Complete	Total
FINAID	Yes	Observed	7251	15604	22855
		Expected	6094.1	16760.9	22855
		% within FINAID	31.7%	68.3%	100%
		% within OUTCOME	50%	39.1%	42.0%
		% of Total	13.3%	28.7%	42.0%
	No	Observed	7252	24284	31536
		Expected	8408.9	23127.1	31536
		% within FINAID	23%	77.0%	100%
		% within OUTCOME	50%	60.9%	58.0%
		% of Total	13.3%	44.6%	58.0%
Total	Observed	14503	39888	54391	
	Expected	14503	39888	54391	
	% within FINAID	26.7%	73.3%	100%	
	% within OUTCOME	100%	100	100%	
	% of Total	26.7%	73.3%	100%	

Findings Related to Research Question #3

The third research question asks, “To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?” A multivariate analysis was conducted in an attempt to determine whether the independent variables operate together to predict successful online course completion. Specifically, a logistic regression analysis was conducted. Logistic regression is a procedure which can be used to predict the likelihood of a certain dichotomous outcome based on values of a set of predictor variables, but it also calculates odds ratios for each of the predictor variables.

Logistic regression was used in this study to determine the possible combined effect of *age, gender, financial aid, and ethnicity dichotomized* on successful online course completion. As with the univariate analysis conducted for research question #2, ethnicity dichotomized was used in this case as well because of the relatively small numbers of minorities in the population.

$\text{Probability of event} = \frac{e (B_0 + B_1 X_1 + B_e X_e)}{1 + e (B_0 + B_1 X_1 + B_e X_e)}$ <p> B_0 = Constant $B_1 \dots B_k$ = Logistic regression coefficients $X_1 \dots X_e$ = Independent variables (age, gender, ethnicity, financial aid) e = Base of the natural logarithms (Approx. 2.718) Probability of no event = 1 -- Probability of event </p>

Figure 5. *Logistic Regression Model*

The logistic regression model used in this study is shown in Figure 5. To test model fit, a -2 Log likelihood value of 58060.685 was associated with a Nagelkerke R^2 statistic of .046. The Nagelkerke R^2 is a goodness-of-fit statistic used in logistic regression and is more closely related to the R^2 used in multiple regression, as it adapts the Cox-Snell (1989) measure so that it varies from 0 to 1, as does the R^2 in multiple regression (Nagelkerke, 1991). The model fit summary for the analysis indicates that only 4.6% of the variance in successful online course completion is accounted for by the four predictor variables measured jointly. The logistic regression analysis, therefore, did not find a significant joint effect of the predictor variables. Consequently, further discussion in chapter 5 will focus on the univariate analyses of the individual predictor variables.

Additional Analyses

Further statistical analyses were conducted in an attempt to further clarify the findings. The findings related to research question #2 indicated that age, ethnicity, and financial aid eligibility were significant predictors of online course completion. In order to determine whether the analyses of ethnicity and financial aid eligibility might be to some degree measuring the same individuals, a chi-square analysis comparing ethnicity and financial aid eligibility was conducted. The analysis revealed that white students were significantly more likely to be ineligible for financial aid, while black students were significantly more likely to be eligible for financial aid, $\chi^2(1, N = 84,070) = 7269.54$, $p < .001$. Details of the analysis are shown in Table 9.

Table 9. *Crosstab Descriptive Statistics for Financial Aid and Ethnicity*

			ETHNDICH		
			Black	White	Total
FINAID	Yes	Observed	19,764	14,170	33,934
		Expected	13,805.69	20,137.31	33,934
		% within FINAID	58.24%	41.76%	100%
		% within ETHNDICH	57.78%	28.42%	40.36%
		% of Total	23.51%	16.86%	40.36%
	No	Observed	14,439	35,697	50,136
		Expected	20,397.31	29,748.69	50,136
		% within FINAID	28.80%	71.20%	100%
		% within ETHNDICH	42.22%	71.58%	59.64%
		% of Total	17.17%	42.46%	59.64%
Total	Observed		34,203	49,867	84,070
	Expected		34,203	49,867	84,070
	% within FINAID		40.68%	59.32%	100%
	% within ETHNDICH		100%	100%	100%
	% of Total		40.68%	59.32%	100%

The findings related to research question #2 also indicated that gender was not a significant predictor of successful online course completion, but ethnicity was found to be a significant predictor. In order to determine whether gender and ethnicity may possibly have a joint effect on successful online course completion, two chi-square analyses of successful course completion based on ethnicity and gender combined were conducted.

The first analysis was conducted for all the male students in the population. The analysis revealed that white males were significantly more likely to be successful completers than black males, $\chi^2(1, N = 21,798) = 256.33, p < .001$. Details of the analysis are shown in Table 10.

Table 10. *Crosstab Descriptive Statistics for Male Students and Ethnicity*

			OUTCOME		
			Non Complete	Complete	Total
MALES	Black	Observed	2,784	4,219	7,003
		Expected	2267.5	4735.5	7,003
		% within MALES	39.75%	60.25%	100%
		% within OUTCOME	39.44%	28.62%	32.13%
		% of Total	12.77%	19.35%	32.13%
	White	Observed	4,274	10,521	14,795
		Expected	4790	10,005	14,795
		% within MALES	28.89%	71.11%	100%
		% within OUTCOME	60.56%	71.38%	67.87%
		% of Total	19.61%	48.27%	67.87%
Total	Observed		7,058	14,740	21,798
	Expected		7,058	14,740	21,798
	% within MALES		32.38%	67.62%	100%
	% within OUTCOME		100%	100%	100%
	% of Total		32.38%	67.62%	100%

The second analysis was conducted for all the female students in the population. The analysis revealed that white females were significantly more likely to be successful completers than black females, $\chi^2(1, N = 62,272) = 1226.58, p < .001$. Details of the analysis are shown in Table 11.

Table 11. *Crosstab Descriptive Statistics for Female Students and Ethnicity*

			OUTCOME		
			Non Complete	Complete	Total
FEMALES	Black	Observed	10,198	17,002	27,200
		Expected	8,208	18,992	27,200
		% within FEMALES	37.49%	62.51%	100%
		% within OUTCOME	54.27%	39.10%	43.68%
		% of Total	16.38%	27.30%	43.68%
	White	Observed	8,594	26,478	35,072
		Expected	10,584	24,488	35,072
		% within FEMALES	24.50%	75.50%	100%
		% within OUTCOME	45.73%	60.90%	56.32%
		% of Total	13.80%	42.52%	56.32%
Total	Observed		18,792	43,480	62,272
	Expected		18,792	43,480	62,272
	% within FEMALES		30.18%	69.82%	100%
	% within OUTCOME		100%	100%	100%
	% of Total		30.18%	69.82%	100%

CHAPTER 5

PRINCIPAL FINDINGS, DISCUSSION AND RECOMMENDATIONS

The purpose of this chapter is to further interpret the findings of the research presented in chapter 4. This chapter consists of five sections: summary of the study, principal findings and discussion, implications for practice, and recommendations for future research.

Summary of the Study

As online distance education continues to evolve and expand, it is evident that nontraditional adult learners make up a significant portion of the student population. The convenience and flexibility afforded by online courses make them a very attractive option for those with employment, family, and other responsibilities. Although they are becoming increasingly common and popular, online courses have typically been shown to have higher dropout rates than traditional, face-to-face courses (S. Carr, 2000; Chyung, 2001; Frankola, 2001; Martinez, 2003; Nash, 2005; Palloff & Pratt, 2003). The research on completion and persistence has not adequately addressed the dropout problem in online distance education. There is a gap in the research on online course completion, with very little existing research that specifically addresses nontraditional students.

The purpose of this exploratory study was to determine the influence of age, gender, ethnicity, and financial aid on successful completion rates for nontraditional adults participating in online technical college courses. In order to accomplish this broad purpose, three research questions were posed.

1. To what extent does successful online course completion in technical colleges differ for three age groups: traditional students (17-21 years), transitional students (22-24 years), and nontraditional students (25 and older)?
2. To what extent do age, gender, ethnicity, and financial aid separately explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?
3. To what extent do age, gender, ethnicity, and financial aid jointly explain observed variation in rates of successful online course completion in technical colleges among nontraditional students?

The population for this study consisted of all students enrolled in at least one online course through the Georgia Virtual Technical College (GVTC) during the year beginning July 1, 2005 and ending June 30, 2006. A total of 89,473 students were included. A data set containing student demographic information and final course grades was obtained from the Georgia Department of Technical and Adult Education (DTAE) data center. These data were prepared and analyzed to determine whether age, gender, ethnicity, or financial aid eligibility had any effect on whether or not a student successfully completed the online course in which he or she was enrolled.

Principal Findings and Discussion

There were five principal findings of this study. The first finding is that there are significant differences in online course completion rates among traditional, transitional, and nontraditional students. Nontraditional students are more likely to successfully complete online courses than transitional and traditional students, with traditional students being the least likely to successfully complete their courses. The chi-square

analysis used to answer research question #1 found that nontraditional students aged 25 and older were much more likely to complete the online courses in which they were enrolled. The same analysis found that traditional students aged 17-21 were much less likely to complete. The transitional students aged 22-24 provided an interesting linkage in this analysis, as they were found to be significantly more likely to complete than traditional students, but less likely to complete than nontraditional students.

This finding is important because very little research has been conducted which examines the completion rates of nontraditional students. Other studies have addressed the influence of age on completion in online courses (Dominguez & Ridley, 1999; Muse, 2003; Wojciechowski and Palmer, 2005), but these treated age as only a continuous variable and did not differentiate between traditional and nontraditional groups.

I have two speculations about why the nontraditional students fared better in terms of course completion. First, these students are more mature in their approach to education, and they understand the importance of finishing their education in terms of career enhancement and the improved quality of life they may enjoy after completion. Also, these students tend to be more focused on completing their studies because many times other aspects of their lives are “on hold” while they devote their time and energy to their education. Because they know that getting back to some level of normalcy with their families and careers is dependent upon completing their educational objectives, they are more likely to do whatever is necessary to persist in the courses and ultimately in their academic program of study.

The second principal finding of this study is that there is a direct, positive correlation between age and successful online course completion. Adding to the findings

of research question #1, an independent t-test was conducted for the analysis of age as a continuous variable in research question #2. The analysis found that older students were significantly more likely to complete. The average age of the students who successfully completed an online course was 35.77 and the average age of those who did not was 33.95.

The findings related to age and online course completion parallel those found by Wojciechowski and Palmer (2005) and Muse (2003), who also found strong positive relationships between age and persistence in online community college classes. An early study by Dominguez and Ridley (1999) also found that the likelihood of completion increased with age. In contrast to the research on age and persistence in face-to-face settings that finds no definitive conclusions (Blecher et al., 2002), the limited research that has addressed age and persistence in online settings seems to indicate a strong positive relationship.

This finding is similar to the first finding in that age is positively associated with successful online course completion. Like my speculations on the first finding, I feel that the older students were more likely to successfully complete their online courses because of the maturity, responsibility, and experiences that usually accompany the process of aging. Younger, traditional students may find it more difficult to fully commit to their studies, as they may be unsure of their future plans.

This finding may be contrary to the assumptions that many people have regarding age and the use of technology. Some may expect younger, traditional students to be more successful in online courses because they may be more knowledgeable, experienced, or comfortable with the Internet, computers, and the entire online environment. This

assumption was proven to be incorrect by this study, as older students completed at higher rates than younger students.

The third principal finding of this study is that white students are more likely to successfully complete an online course than black students. A chi-square analysis of the *ethnicity dichotomized* variable found that white students successfully completed the courses at higher rates than black students. These findings are supported in the literature by several studies which found minorities were less likely to complete courses or programs (Allen, 1997; DuBrock, 2000; Feldman, 1993; Wiggam, 2004).

My speculation on this finding is that there are most likely multiple reasons that black students completed their online courses at lower rates than white students. Access to computers with reliable Internet connections is likely to be more limited for minority students. These students may not be as likely to have convenient Internet access at home, and may have to rely on access to public Internet terminals in order to participate in online distance education. Also, community and family support for educational pursuits may not be as strong in many minority communities where educational levels are traditionally low. If family members of students have never enrolled in college courses, they may not be as understanding and supportive of the students' efforts.

The fourth principal finding of this study is that males and females do not complete their online courses at significantly different rates when gender alone is examined. A chi-square analysis of the gender variable was used to answer research question #2, and found no significance. The possible effect of gender on completion and persistence in traditional face-to-face settings has been studied in the literature with mostly inconclusive or contradictory findings (Baker & Velez, 1996; Fenske et al., 2000;

Liu & Liu, 2000), and little research has been conducted on the relationship between gender and persistence in online settings.

My speculation on why males and females completed their online course at similar rates is that gender roles are changing in our society. Females made up a larger percentage of the population than males, but there was no significant difference in their rates of course completion. This indicates to me that adult students, regardless of gender, are equally committed to their educational endeavors and possibly have similar roles and responsibilities in terms of family and career.

The additional analyses on gender that examined gender paired with ethnicity did find significance. This finding further reinforces the findings that ethnicity has a significant effect on online course completion.

The fifth principal finding of this study is that students who are eligible to receive Pell grants are less likely to successfully complete online courses than those students not eligible for Pell grants. Eligibility for Pell is an indicator of low household income. A chi-square analysis found that students who were not eligible for a federal Pell grant were more likely to complete their online courses than those who were eligible for Pell grants. The findings here are more difficult to compare to other research because of the nature of the variable. In this study, eligibility for financial aid (specifically Pell eligibility) was used as a variable rather than *receipt* of financial aid. Receipt of financial aid would not have yielded accurate information in this study because the majority of the cases involve students enrolled in courses which were not eligible for Pell grants. Technical certificate credit programs comprise most of the online course offerings through GVTC, and those are not Pell-eligible even for those who qualify.

My speculation on this finding is that family income, like ethnicity, may have an effect on access to technology. Low-income families are not as likely to have computers and reliable Internet access in their homes as more affluent families, so convenient access to online classes may be limited. Students from low-income families may have to rely on public computer terminals for participating in online distance education. Low-income students may also have increased demands placed on them in addition to their studies. Job and family responsibilities, including child care, may be greater barriers to overcome for lower-income students.

An additional analysis of ethnicity and financial aid eligibility indicated that black students were more likely to be eligible for financial aid than white students. This analysis demonstrates that ethnicity and financial aid eligibility may be highly related. Again, my speculation is that family income level may have a significant impact on successful online course completion.

Implications for Practice

The findings of this study have practical implications for anyone involved in the planning, teaching, or supervision of online credit courses. By understanding the personal characteristics of students which may place them at a higher risk of dropping out or otherwise unsuccessfully completing an online course, course modifications and other early interventions may be made. Everyone benefits when students persist in their studies and successfully complete their courses and their academic programs, so it is in the best interest of everyone involved to recognize potential predictors of noncompletion and to be proactive in keeping students engaged and making academic progress.

For instructors teaching online courses, an awareness of the students' personal characteristics requires more of an effort than is needed in a traditional, face-to-face course. Because the instructor and students may never meet in person, it would benefit the instructor to do as much research as possible on the demographics of each student. The predictor variables included in this study—age, gender, ethnicity, and financial aid eligibility, are typically available to instructors, either on a class roster or in the institution's student information database. Accessing this student information can assist the instructor in tailoring instruction specifically to the students and in identifying those most at risk for noncompletion.

The findings of this study suggest that younger students, those eligible for Pell grants, and black students are at risk of not completing their online courses. Because age was determined to be positively associated with successful online course completion, extra attention can be given to the younger students who are less likely to complete than their older classmates. The study also determined that black students and those eligible for Pell grants are less likely to successfully complete their online courses, so an awareness of these characteristics can aid the instructor in ensuring that all students are provided opportunities for success.

If possible, orientation sessions, either online or face-to-face, could be held prior to students' enrollment in online courses. These sessions could help to assess at-risk students' readiness for online instruction by explaining course expectations, including such information as time requirements, technical skills needed, and minimum standards for computers, software, and connectivity. During these sessions, interactivity could be incorporated in order to learn as much as possible about each of the new students, so

possible at-risk characteristics might be identified and intervention strategies incorporated as early as possible. Examples of possible intervention strategies are small-group projects involving diverse team members, mentoring programs in which experienced, successful online students are paired with new students, and frequent online discussions in which all students are expected to participate.

Recommendations for Future Research

Further studies are needed in order to expand the body of knowledge on persistence and completion in online courses. As described previously, there is a dearth of empirical research that examines persistence or completion among nontraditional adult learners in online learning environments.

This study did not include a representative distribution of minorities in the population, so there is still a need to examine a large student population with an ethnically diverse makeup. Also, other possible predictor variables might yield significant findings, such as program of study, grade point average, entrance/placement exam scores, employment status during enrollment, or others. These variables have the potential for impacting course completion for nontraditional students because they may represent additional factors that could affect the students' success, such as readiness for academic study and time available for devoting to study. Additional studies of these variables would provide educators of adult learners with a further understanding of online course completion.

Qualitative research might also be employed to gain further insight into other non-demographic contributors to noncompletion of online courses. Students fail to complete for a variety of reasons, not all of which can be measured statistically from demographic

data. The use of personal interviews, case studies, and observations might yield additional insight into the ongoing problem of student persistence, as these methods are able to assess motivational factors and barriers that are not discernable from statistical analyses of demographic data.

This study might be replicated in other technical or community college systems in order to determine whether these same predictors are significant in online settings in those systems. Technical and community colleges typically attract similar students in terms of demographics, and it would be interesting to see a similar study done with another large online population.

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APPENDIX A

GRADE DISTRIBUTION OF THE FULL POPULATION

APPENDIX A: GRADE DISTRIBUTION OF THE FULL POPULATION

Final Course Grade	Frequency	Percent	Cumulative Percent
A	27,210	30.4	30.4
B	19,826	22.2	52.6
C	10,711	12.0	64.5
D	3,751	4.2	68.7
F	10,438	11.7	80.4
S	644	.7	81.1
U	344	.4	81.5
W	12,267	13.7	95.2
WF	1,574	1.8	97.0
WP	2,708	3.0	100.0
Total	89,473	100.0	100.0

APPENDIX B

AGE DISTRIBUTION OF THE NONTRADITIONAL STUDENTS

APPENDIX B: AGE DISTRIBUTION OF THE NONTRADITIONAL STUDENTS

Age	Frequency	Percent	Valid Percent	Cumulative Percent
25	3,784	6.96	6.96	6.96
26	3,434	6.31	6.31	13.27
27	3,191	5.87	5.87	19.14
28	3,244	5.96	5.96	25.10
29	2,798	5.14	5.14	30.25
30	2,933	5.39	5.39	35.64
31	2,738	5.03	5.03	40.67
32	2,773	5.10	5.10	45.77
33	2,414	4.44	4.44	50.21
34	2,593	4.77	4.77	54.98
35	2,113	3.88	3.88	58.86
36	1,999	3.68	3.68	62.54
37	1,731	3.18	3.18	65.72
38	1,692	3.11	3.11	68.83
39	1,648	3.03	3.03	71.86
40	1,676	3.08	3.08	74.94
41	1,491	2.74	2.74	77.68
42	1,330	2.45	2.45	80.13
43	1,242	2.28	2.28	82.41
44	1,243	2.29	2.29	84.70
45	1,010	1.86	1.86	86.55
46	947	1.74	1.74	88.29
47	996	1.83	1.83	90.13
48	867	1.59	1.59	91.72
49	794	1.46	1.46	93.18
50	574	1.06	1.06	94.23
51	545	1.00	1.00	95.24
52	433	0.80	0.80	96.03
53	472	0.87	0.87	96.90
54	423	0.78	0.78	97.68
55	258	0.47	0.47	98.15
56	217	0.40	0.40	98.55
57	174	0.32	0.32	98.87
58	191	0.35	0.35	99.22
59	107	0.20	0.20	99.42
60	68	0.13	0.13	99.54
61	39	0.07	0.07	99.62
62	33	0.06	0.06	99.68
63	51	0.09	0.09	99.77
64	26	0.05	0.05	99.82
65	27	0.05	0.05	99.87
66	13	0.02	0.02	99.89
67	10	0.02	0.02	99.91
68	10	0.02	0.02	99.93
69	7	0.01	0.01	99.94
70	4	0.01	0.01	99.95
71	13	0.02	0.02	99.97
72	1	0.00	0.00	99.97
74	2	0.00	0.00	99.98
75	6	0.01	0.01	99.99
76	3	0.01	0.01	99.99
81	3	0.01	0.01	100.00
Total	54,391	100.00	100.00	