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Send out your light and your truth! Let them guide me. Psalm 43:3

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The Relationship between Selected Predictor Variables and Successful Completion of Online Courses at a Selected Theological Institution

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The Relationship between Selected Predictor Variables and Successful Completion of Online Courses at a Selected Theological Institution

Introduction

During recent years, technology has dramatically impacted the lives of individuals and the functioning of organizations. The technological advancement in the Internet, computer hardware, and software has facilitated rapid and relatively easy communication between individuals and organizations.

Institutions of higher learning, including theological institutions, have embraced this advancement in technology and are using rapid and relatively easy means of communication to deliver courses and degree programs from central locations to students located throughout the world. They have aggressively marketed on the basis of convenience and affordability. This is evidenced by the proliferation of print media and television, radio, and Internet marketing designed by colleges and universities to recruit students. Further, there are a growing number of institutions of higher learning that do not offer traditional, campus courses but only offer online courses. Others offer a mixture of on-campus and online courses (Howell, Williams, & Lindsay, 2003).

Students have also embraced online instruction. Many students have used their technology coupled with the institution's technology to complete courses and degree programs, replacing on-campus classroom courses (Wojciechowski & Palmer, 2005). Online instruction is no longer rare as a delivery methodology. In fact, most states have institutions of higher learning that have utilized various forms of online technology for students who may never visit the campus (Dutton, Dutton, & Perry, 2002; Epper & Garn, 2003). Institutions which utilize online technology to offer courses provide students with the option of continuing and completing their

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education in their local environment (Wojciechowski & Palmer, 2005).

Online instruction assists students in reaching educational goals that may not have been attainable through other modes of instruction. This mode of instruction differs from the more rigid on-campus mode of instruction. For example, differences include the start/end times for semesters, days and times for interaction, and the ability to access the institution from any location having internet access (Carnevale, 2000; Dutton et al., 2002).

Lorenzetti (2005) contends that there are many students who either would not be able to continue their education at the postsecondary level or who would have to settle for less than adequate educational experiences if they were not able to take classes online. Lorenzetti also asserts that due to their seemingly endless array of obligations and responsibilities relating to their work schedules, family structures, and lifestyles, these students are invariably drawn to the less demanding yet highly functional routine of online classes.

For whatever reason, there has been growth in the number of nontraditional students engaging in online education. This much supported fact requires a better understanding about nontraditional learners and the predictors of academic success in their online programs. Administrators in theological institutions of higher learning can better serve students who are selected based, in part, on their likelihood of success.

Online Education

In ever increasing numbers, secular and theological institutions of higher learning alike provide nontraditional students with an alternative means for completing degree programs. With the recent advances in electronic technology related to communication, people and organizations are no longer constrained by location or time. For example, surfing the Internet from various locations (e.g., home, school, work, etc.) at all times of the day is now common practice.

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Embracing this means for communication, many institutions of higher learning are using the Internet to provide educational opportunities. Students participate in courses with little regard to day of the week, time of day, or his/her location. The Internet is, among many things, a far reaching, communication bridge that links students and professors. “Universities across the United States are placing an increasing emphasis on offering courses online in order to educate students who are geographically dispersed without causing undue disruption to their daily activities, such as work and family responsibilities” (Thirunarayanan & Perez-Prado, 2002, p. 131). There are a number of dynamic forces impacting the demand and supply for online courses. “The rapid expansion of the Internet as a potential course delivery platform, combined with the increasing interest in lifelong learning and budget restrictions, has created a significant incentive for universities to develop online programs” (Volery & Lord, 2000, p. 216)

In recent years, online education has become an attractive alternative to on-campus education for adults who are unable or who are unwilling to attend classes at a central location. A survey conducted by Eduventures of approximately 2,000 college-bound individuals revealed that approximately 51% of the respondents either wanted to complete their entire degree program online or some percentage of the degree program online (Carnevale, 2006). Other research indicates that online education offers the flexibility that many adults need as they handle the responsibilities of work and family life (O’Lawrence, 2006). Other concur:

It is widely acknowledged that nontraditional students (that is, working adults returning to school or students who are unable to attend classes on campus for other reasons) make up a rapidly growing population in education today. Their educational needs and demands are different from those of traditional students and it is these students to whom online distance education is geared. (Palloff & Pratt, 2001, p. 3).

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Many institutions have designed online degree programs to serve the adult learner who desires to achieve his/her educational goals without ever visiting a traditional classroom and to meet the institution's strategic goals. Specifically, these online programs are assisting colleges and universities in their efforts to increase overall student enrollment (Alstete & Beutell, 2004).

Numerous studies (Hannay & Newvine, 2006; Schumm, Webb, Turek, Jones, & Ballard, 2006; Coma Del Corral, Guevara, Luquin, Pena, & Otero, 2006; Allen, Bourhis, Burrell, & Mabry, 2002) have examined whether online instruction is as effective as instruction provided in the traditional on-campus classroom. Hannay and Newvine found that students preferred online instruction over classroom instruction. The researchers examined 217 adult learners in a distance education course and found that these learners chose distance education over the traditional classroom because the online courses fit better with their schedule and the students were able to better achieve academic goals. Schumm, Webb, Turek, Jones, and Ballard (2006) also found that instruction offered through the distance education format was as effective, and in some cases more effective, than instruction offered through the traditional classroom format.

A study by Allen, Bourhis, Burrell, and Mabry (2002) found that instruction offered through the traditional classroom format was slightly more appealing to students than instruction offered through the distance education format. In their study of doctoral students, Coma Del Corral, Guevara, Luquin, Pena, and Otero (2006) found no difference in course outcomes between the students who took a course through distance education and the students who took the same course in the traditional classroom. The issue of "no significant difference" between courses taught through distance education and courses taught in the traditional classroom education received much attention in Thomas L. Russell's book, *The No Significant Difference Phenomenon*. In his book, Russell examined the findings from 355 studies that were conducted

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between 1928 and 1998 and determined that there was no significant difference in the effectiveness of courses taught using the two methods.

The inability to provide substantial, consistent evidence whether online instruction is as effective as traditional classroom instruction has not hurt the popularity of online instruction at most institutions of higher learning. In a report by Eduventures, almost one million students were enrolled in online courses during 2004 and the number of students enrolled in online courses in 2005 was projected to be substantially higher (Carnevale, 2005). According to a report by the Sloan Consortium (2006), “There has been no leveling of the growth rate of online enrollments; institutions of higher education report record online enrollment growth on both a numeric and a percentage basis. Nearly 3.2 million students were taking at least one online course during the Fall 2005 term...” (p. 1).

Background of the Study

The number of nontraditional students continues to increase on college campuses across the United States (Bell, 2003). These students have various characteristics that distinguish them from traditional age students. Horn (1996) provides the following descriptors for nontraditional students: Nontraditional students are generally over the age of 25. For various reasons these students have entered into postsecondary education at later stages in their lives. In addition to being older, nontraditional students are employed full-time. Work responsibilities are one of the reasons nontraditional students cannot commit to the rigor of the traditional classroom. Being older, nontraditional students are not dependent upon parents or other family members for financial support in their educational endeavors. Due to family and work responsibilities, nontraditional students do not often enroll in full-time course work. The majority of these students are enrolled as part-time students.

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Institutions of higher learning that offer degree programs online are major attractions for nontraditional students. Online degree programs oftentimes offer the flexibility needed by nontraditional students who must hold down work and family responsibilities while pursuing a college education. Institutions of higher learning that are able to capitalize on this growing market of students have countless windows of opportunity open to them for providing quality, affordable education which meets the educational needs of nontraditional students.

The institution of higher learning selected for this study is a theological institution from the southeast region of the United States. This institution began pioneering work in the field of distance education over forty years ago. Before online instruction infiltrated the halls of higher education, institutions desiring to offer education at a distance did so through the mail. This institution began its journey in distance education by offering these courses to church pastors in various parts of the world. During this particular time in the institution's history, correspondence courses were so innovative and nontraditional in nature that they garnered the interest and attention of thousands of students from across the United States as well as students from 52 other countries throughout the world (Self-Study Report, 2005).

In recent years, the selected institution successfully made the transition from offering distance education courses through the correspondence format to offering distance education courses through an online format. Bridging the gap between offering correspondence courses through print/mail options and offering online courses via modern technology required the institution to upgrade its technology and to provide training related to online instruction for administrators, faculty, staff and students of the institution. Faculty, in particular, were expected to learn how to teach courses online while continuing to teach the same courses on campus. Online versions of courses have been offered simultaneously with the on-campus versions,

lasting for a period of fifteen weeks, or one trimester. Often students will take a combination of online and on-campus courses to maximize the number of courses they can take each semester to meet the requirements of the degree being sought and to reduce the number of obstacles they might face in fulfilling those requirements.

One study concluded that a sobering 78% of all students who are classified as adult learners have been involved in distance learning programs at some time during their educational endeavors (Parker, 2003). This statistic is indicative of the growth in enrollment of nontraditional students on college and university campuses which has occurred in recent years. Approximately 95% of the student enrollment at the theological institution selected for this study is comprised of nontraditional students—students who are 25 years of age and older. The number of nontraditional students at this institution far exceeds the number of nontraditional students found at most universities across the country (Bell, 2003).

The institution selected for this study has experienced dramatic growth in enrollment in the last five years. This increase in enrollment has been largely attributed to the increase in the number of online students. More and more of the institution's student body are choosing to enroll in online classes. The institution's student body largely consists of adult learners. These students either work full-time or are serving full-time in a ministry-related area. The online course format is an easier fit for their demanding work schedules than the traditional on-campus format.

The online enrollment data taken from the institution's enrollment/student database present an unduplicated headcount for this institution's enrollment figures. Students who enrolled in more than one online course during the same semester were only counted once in the institution's total enrollment figures. Enrollment increased from 117 students taking 6 online courses in Fall 2002 to 899 students taking 37 online courses in Spring 2007. The selected

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institution saw an increase in online student enrollment of 668% over the five-year period. The increase in online enrollment at the selected institution is typical of the increase in online enrollment at colleges and universities across the United States (Ausburn, 2004). In addition, the average number of courses in which students were enrolled showed a steady increase almost every semester during the five-year period. The average number of courses taken per student per semester for the past five years at this university ranged from 1.14 in 2002 to 1.97 in 2007.

Although increases in enrollment are generally viewed as a positive for any theological institution, there is a negative side to the growing enrollment phenomenon. Increases in enrollment have generally been associated with increases in drop rates (Diaz, 2002). Institution administrators must figure out how to close this “back door” so that enrollment increases can be sustained over long periods of time. Although enrollment continues to increase in online courses each semester at the selected theological institution, institution administrators are concerned with the number of courses that are dropped by students before the semester ends.

Between Fall 2002 and Spring 2007, online students at the selected theological institution dropped an average of 106 courses per semester. The institution had an average drop out percentage of 13.22% each semester during the last five years. The institution experienced an increase in online student withdrawal from courses of 252% over the five-year period. In a study conducted by Diaz (2002), study results showed a drop rate of 13.5% for students enrolled in an online health education course. In a report by Carr (2000) in the *Chronicle of Higher Education*, the following statistics were reported concerning online drop rates:

Although there is significant variation among institutions—with some reporting course-completion rates of more than 80 percent and others finding that fewer than 50 percent of distance-education students finish their courses—several administrators concur that

course-completion rates are often 10 to 20 percentage points higher in traditional courses than in distance offerings. (p. A39)

Although the selected institution's average drop rate over the five-year period is lower than the figure reported at most institutions, 13.22% is a high drop rate for this institution considering the small number of students taking online courses.

There are a number of factors which can contribute to students deciding to drop a course. These reasons could be related to finances, family, work, or academics. Given the fact that nontraditional students have more responsibilities that are not related to the academic arena, these students have more reasons for dropping a course than the typical traditional-age student (McGivney, 1996; Kemp, 2002).

Statement of the Problem

The selected theological institution in the southeast region of the United States has a nontraditional student population of 95%. The students who attend this institution have a diverse demographic makeup and sometimes struggle academically with online classes for various reasons. The purpose of this study was to determine if any of the selected variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) were related to grade achievement of nontraditional, online students at the selected institution.

This study was designed to address the following research question: Is there a relationship between any of the selected variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) and grade achievement of nontraditional, online students at the selected institution?

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Statement of the Hypotheses

This study explored the relationships among age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load and grade achievement of nontraditional, online students at a theological institution. The hypotheses were as follows:

H₁: There is a relationship between some of the selected variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) and grade achievement of nontraditional, online students at the selected institution.

H₀: There is no relationship between any of the selected variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) and grade achievement of nontraditional, online students at the selected institution.

Professional Significance of the Study

A number of studies have examined variables that may predict the success of students in online classes. Irizarry's (2002) study identified self-efficacy and motivation as possibly being predictors of online success. Parker's (2003) study identified locus of control and self-motivation as predictors of academic persistence in distance education. Waschull's (2005) study identified self-discipline and motivation as being variables that may predict the success of students in online classes. Although research in this area has been plentiful, previous research has not consistently identified which variables influence online success.

This study will contribute to the existing body of knowledge by investigating variables

which may be associated with grade achievement of nontraditional, online students. The number of nontraditional students continues to increase on college campuses across the United States (Bell, 2003). Prior research has shown that more and more of these students are choosing to enroll in online courses rather than the traditional on-campus courses (Ausburn, 2004). Since nontraditional students constitute a sizeable proportion of the student body on many college and university campuses (Miller & Lu, 2003), it is important that specific variables be identified which may hinder online academic success. By identifying the unique variables which may hinder academic success of nontraditional online students, theological institutions can develop policies and programs which can encourage the success of this growing segment of its student body.

Although nontraditional students have an attraction for online courses, not all of these students are able to succeed in these type courses. Early identification of students who are at risk for failure in online courses can help academic advisors steer students in the right direction when it comes to developing an academic plan. According to Wojciechowski and Palmer (2005), “The identification of characteristics associated with successful online students could provide the necessary information for teachers and admissions personnel to suggest or discourage a student from registering for an online course” (p. 3). With the number of nontraditional students on college campuses continuing to increase, continual achievement by these students in online classes is imperative. Depending on the size of the institution, noncompletion of online courses can have a profound effect on the institution’s budget, especially on the budgets of smaller institutions like the one in this study.

The findings from this study will help theological institutions develop online learning experiences which are designed to help students over the age of 25 continue to achieve.

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Institutions must remain diligent in discovering which variables cause nontraditional, online students to postpone or end their pursuit of a college degree. The discovery of these specific variables, along with the development of innovative, online educational programs, will have positive benefits for both the institution and the online student. In contrast, failure to identify specific variables which may influence academic success of online students and failure to design programs designed to help these students can have negative results for both the institution and the student (McGivney, 2004).

Terminology and Definitions

Age – Refers to the chronological age of the student.

Theological Institution – The Association of Theological Schools (2005) provides the following definition of a theological school: “A theological school is a community of faith and learning that cultivates habits of theological reflection, nurtures wise and skilled ministerial practice, and contributes to the formation of spiritual awareness and moral sensitivity” (p. 144). The Association of Theological Schools has accredited over 250 graduate schools in the United States and Canada.

Ethnicity – Students are categorized using the following ethnic descriptors (Horn, 1996, p. 52):

- “Asian/Pacific Islander: A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam”;
- “African American (Black, non-Hispanic): A person having origins in any of the black racial groups of Africa, not of Hispanic origin”;
- “Caucasian (White, non-Hispanic): A person having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin)”;

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- “Hispanic: A person of Mexican, Puerto Rican, Cuban, Central or South America or other Spanish culture or origin, regardless of race”;
- Other: A person having origins in any ethnic group other than African American, Asian, Caucasian, or Hispanic.

Financial Assistance – Identifies students who receive financial aid such as federal loans or grants.

Gender – Students are categorized as either male or female.

Grade Achievement (Pass/Fail) – Grade achievement is indicated by a passing or failing grade in the online course. Students who received a grade of A, B, or C were categorized as passing or successfully completing the online courses. Students who received a grade of D, F, W, WD, WP, or WF were categorized as failing or not completing the on line courses. A numerical grade of at least 71 is required to receive a letter grade of at least a C at the undergraduate level. A numerical grade of at least 78 is required to receive a letter grade of at least a C at the graduate level.

Marital Status – Students are categorized as single, widowed, divorced, or married.

Nontraditional students – Students who have attained an age of at least 25 and are now enrolled in a religious, post-secondary degree-granting institution.

Number of Current Online Courses – The number of online courses (taken at the selected institution) in which the student was enrolled during Spring semester 2007.

Number of Previous Online Courses – The number of online courses (taken at the selected institution) in which the student was enrolled prior to Spring semester 2007.

Online Course – A course offered by the selected institution in which the delivery method was done entirely through the Internet via the e-learning software, Blackboard. Students obtain and

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submit assignments via Blackboard as well as interact with the professor and other students via discussion boards, online chat rooms, and email.

Student Status – Students are categorized as either part-time students or full-time students.

Methods

Research Design

The research design implemented for this study was a quantitative, correlational design. Logistic regression analysis was performed to determine whether or not any of the eight independent variables influenced the dependent variable. “Logistic regression is used to predict a dichotomous criterion variable from a combination of several independent variables. Logistic regression also involves a situation where the criterion variable is categorical. In addition, logistic regression analysis is used when some or all of the predictor variables are categorical” (Gliner & Morgan, 2000, p. 300).

The researcher was able to utilize the student database from the selected institution to obtain demographic and educational information for students enrolled in online courses during Spring 2007. Data were provided to the researcher by the Information Technology Department. No identifying information was provided to the researcher with the student data. Every student enrolled in the program during that particular semester was included in the study. There were a total of 37 online courses with an enrollment of 899 students.

The researcher used a correlational logistic regression analysis to study the relationship of the independent variables with the dependent variables.

This quantitative, correlational research study investigated the relationships among age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load, and grade achievement. “Although correlational research

cannot demonstrate causal relationships, it is a necessary complement to experimental research” (Bauserman, 1996, p. 406). Correlational research has been described as nonexperimental quantitative research (Ary, Jacobs, Razavieh, & Sorensen, 2006). “In nonexperimental quantitative research, the researcher identifies variables and may look for relationships among them but does not manipulate the variables” (Ary et al., p. 29). Nonexperimental research differs from experimental research in that researchers are not able to control the data in nonexperimental research studies. Researchers must simply take the data as they are presented and sort out the data (Kerlinger & Lee, 2000).

According to Ary et al. (2006), a significance level of .05 and .01 are used frequently in research studies. The level of significance for the analyses in this study was established at .05.

The researchers utilized logistic regression analysis and descriptive statistics to answer the research hypotheses since it has been hypothesized that eight independent variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) may influence one dependent variable (grade achievement).

Research Context

The research activities in this study covered a four-month period, from January 16, 2007, to May 5, 2007. The research took place at a small, four-year theological institution in the southeast region of the United States. The institution has been in existence for 45 years. The institution has a long history of being involved with distance education. For almost 40 years, this institution has been offering courses in a distance education format to supplement the course offerings in the traditional classroom format. In the late 1960s the institution began offering correspondence (print mail) courses to pastors around the world who could not relocate to take courses at the institution’s main campus. Correspondence courses became popular with the

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institution's distance learning students and these courses became a major source of course delivery for the institution. The institution continues to offer courses through distance learning to supplement its course offerings in the traditional classroom format. However, the distance learning courses are now being offered entirely online rather than through print mail.

The selected institution utilizes Blackboard software to offer online courses to its students. Through Blackboard, students are able to access their online courses and interact with the professor and other students taking the course via a live chat room and a discussion board. Students are also able to obtain course materials such as announcements, course syllabus, course schedule, online lectures, lecture notes, quizzes, exams, discussion questions, and external links which help students in fulfilling online course requirements. Online courses are offered in an asynchronous format which means that the professor and the students are not required to be online at the same time in order to communicate with each other. Students may post and respond to online discussions at anytime during a 24-hour day. This institution has been utilizing Blackboard to offer online courses to its students for the past five years.

The courses offered by the theological institution are identical, regardless of the format used to deliver the courses. The on-campus and online version of the courses have the same course descriptions, objectives, assignments, and are normally taught by the same professor. The selected institution offers six degree programs: one at the bachelor's level, four at the master's level, and one at the doctoral level. The four master's level programs can be obtained entirely online.

The institution has approximately 1,047 students. The institution has a diverse student body. The students' ages range between 19 and 77, with an average age of 41. The ethnic makeup of the student body population is as follows: 55% Caucasian, 32% African American,

9% Asian, 2% Hispanic, and 2% Other. Three hundred seventy-five (375) students are enrolled in the institution's undergraduate program (Bachelor of Arts in Religion). Six hundred thirty-eight (638) students are enrolled in the institution's four master's degree programs (Master of Divinity, Master of Arts in Biblical Counseling, Master of Arts in Christian Studies, and Master of Arts in Leadership). Thirty-four (34) students are enrolled in the institution's Doctor of Ministry program. The student body population at the selected institution is largely comprised of part-time, male students. Of the 303 full-time students, 210 are male students and 93 are female students. Of the 744 part-time students, 575 are male students and 169 are female students.

The institution is primarily a commuter institution. Students either drive to the campus to take courses or courses are offered to students via the World Wide Web. Classes are offered in the traditional classroom format five days and three nights each week during a 15-week semester. The institution also offers Saturday classes which take place five Saturdays during the 15-week semester. Each Saturday class lasts approximately eight hours. During the summer, the institution offers online classes during a 15-week semester.

The mission of the institution is to provide theological education to Christian ministers and leaders around the world. A major goal of the institution has always been to "graduate ministers who were competent in preaching and teaching the biblical message, in leading the church to obey the Great Commission, in counseling and guiding the confused, and in writing as an extension of ministry" (Witty, 1993, p. 32). The academic programs offered by the institution prepare students to serve in various leadership roles within the local church. Students receive training in Bible and theology, preaching, counseling, leadership, Christian education, and other ministry-related subjects.

The institution is governed by a seventeen-member board. The institution's

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administration consists of the institution's President, the Chief Academic Officer, the Chief Financial Officer, the Director of Student Affairs, the Director of Institutional Effectiveness, the Registrar, the Librarian, the Admissions Director, and the Director of Financial Aid. The institution has 14 full-time faculty members and 23 part-time faculty members. The institution has 17 full-time support staff. The facilities consist of three buildings which house the administrative offices, individual classrooms, and the library.

Research Participants

The research participants for this study consisted of all students enrolled in at least one online course offered at the selected institution during Spring 2007. The Registrar's office provided a list of 37 online courses that were offered Spring 2007. All courses were offered for college credit and were offered entirely online with no face-to-face component. From these courses, a total of 899 students were selected for inclusion in the sample. There was an average of 24 students in each course. Since the number of students enrolled in online classes represented more than 80 percent of the entire student body, the decision was made to include all of the students who enrolled in online courses for the Spring 2007 semester in the study. The institution has a diverse student body. The study consisted of 706 male students (79%) and 193 female students (21%). The students' ages ranged between 20 and 72 with an average age of 41. The study included 610 graduate students and 289 undergraduate students. The ethnic makeup of the study population consisted of 61% Caucasian, 31% African American, 5% Asian, 2% Hispanic, and 1% Other.

The student characteristics of the study population mirror that of the general student body population. The description of the online learners at the selected institution fits well with Pallof and Pratt's (2003) and Gilbert's (2001) description of online learners:

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There is an ongoing debate in the academic world about who is attracted to online learning. It has been assumed that it is predominantly adult learners who take online courses because online learning allows them to continue working full time and attend to their family obligations through the delivery of anytime, anywhere education. The “typical” online student is generally described as being over twenty-five years of age, employed, a caregiver, with some higher education already attained, and equally likely to be either male or female (Gilbert, p. 74). Online students may be nontraditional undergraduate, graduate, or continuing education students. (p. 3)

In selecting which institution to include in the study, the researcher identified several theological institutions affiliated with the same accrediting body which accredits theological institutions. The researchers selected this particular institution due to the large number of nontraditional students which make up the student body population. Approximately 96% of the students who enrolled in online courses during the Spring 2007 semester were 25 years of age or older. Today, nontraditional students make up a large portion of the student body on most college and university campuses (Chao & Good, 2004; Evelyn, 2002; Kinsella, 1998; Miglietti & Strange, 1998). This institution had a sufficient number of students for this type of study enrolling in online courses each semester.

Instrumentation

No research instruments were used in this research since the data which were used to test the research hypothesis had been previously collected and stored in the selected institution’s enrollment database and only needed to be extracted from the database for use in this study.

Procedures

The researchers identified and selected a theological institution in the southeastern region

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of the United States from a list of theological institutions accredited by the same national accrediting agency. The researchers contacted the President of the institution via telephone and written communication to schedule a meeting to discuss the proposed study. The researchers provided the President with complete information regarding the study and requested permission from the President to use the institution's data in the research study. The researchers explained to the institution's president that the following information from the institution's enrollment/student database was needed for the study: age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load and grades of students who enrolled in online classes during Spring 2007.

After obtaining approval from the institution's president to include the institution in the study, the researchers contacted the Institutional Review Board (IRB) of Liberty University to obtain approval to use human subjects in the proposed study. Approval was granted by the IRB on May 31, 2007. Since research involving human subjects may have ethical issues associated, the pre-existing data collected for the study from the student/enrollment database was collected, recorded, and maintained in such a way that anonymity of the participants and confidentiality of the student information was preserved.

The selected institution collects demographic information on its students at the time students apply for admission. This information is transferred from an online student application to the institution's enrollment/student database. At the beginning and end of each semester, the institution also collects information regarding students' grades in its student database which includes information regarding grades students receive in courses, cumulative grade point average, withdrawals from courses, financial assistance, the current number of credit hours in which students are enrolled, and the previous number of credit hours students have already taken.

All eight independent variables and the one dependent variable were extracted from the enrollment/student database.

Data Collection

The data for this research study were collected from the enrollment/student database of the selected institution. The theological institution providing data for this study was an institution which has been accredited by the Transnational Association of Christian College and Schools (TRACS). TRACS was recognized by both the United States Department of Education and the Council for Higher Education as a national accrediting body for theological institutions, colleges, universities, and seminaries. Most institutions have a standard procedure for collecting demographic, enrollment, and course grade data from students. These data are normally collected at the time a student applies for admission to the institution as well as when grades are submitted at the end of each semester. Annual requests of enrollment data from TRACS and the Integrated Postsecondary Education Data System (IPEDS) compel these institutions to ensure the integrity of the data which are collected and maintained in their enrollment/student database.

Data Analysis

The analysis began with descriptive statistics. Summary statistics, such as means and standard deviations, were computed and histograms were generated for quantitative variables. Frequencies were tabulated and bar graphs were generated for categorical variables.

One of the first steps in conducting a logistic regression was to check for multicollinearity. "Multicollinearity occurs when there are high intercorrelations among some set of the predictor variables. In other words, multicollinearity happens when two or more predictors contain the same information" (Morgan, Leech, Gloeckner, & Barrett, 2004, p. 127). The measures which were utilized to assess collinearity were the tolerance value and the variance

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inflation factor (VIF) (Hair, Anderson, Tatham, & Black, 1998).

These measures tell...the degree to which each independent variable is explained by the other independent variables. In simple terms, each independent variable become a dependent variable and is regressed against the remaining independent variables.

Tolerance is the amount of variability of the selected independent variable not explained by the other independent variables. Thus very small tolerance values denote high collinearity. The VIF is equal to 1/tolerance. (Hair, Anderson, Tatham, & Black, p. 193).

VIF greater than 10 is generally considered to be an indication that multicollinearity exists in the data (Hair, Anderson, Tatham, & Black).

A logistic regression model is frequently used when the dependent variable is dichotomous. Let Y be the dependent variable, which takes on values 1 (event) and 0 (nonevent). Further, let p denote the probability that an observation is an event, that is, $p = P(Y = 1)$. The logistic regression models the log-odds of an event as a function of a linear combination of the intercept and slope parameters:

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k.$$

Unlike the ordinary regression, there is no closed-form solution for the parameters. Therefore, these parameters must be obtained by an iterative process using a computer (e.g., SPSS).

With the obtained estimates, it can be shown that

$$\hat{p} = \frac{\exp\{\hat{\alpha} + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \cdots + \hat{\beta}_k x_k\}}{1 + \exp\{\hat{\alpha} + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \cdots + \hat{\beta}_k x_k\}},$$

which gives the estimated probability that an observation is an event. Usually, when this probability is greater than 0.5, the observation is classified as event. Otherwise, it is classified as nonevent.

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Like the ordinary regression, there are several options for variable selection. In the present study, a backward-elimination method is used. The advantage of this method is that it can include a variable that does not have a strong association with the dependent variable by itself but has some contribution in the model with the presence of other variables. Of course, such a variable will not be detected when a forward-selection method is used.

To check the model fit, the correct classification rate was considered and the Hosmer-Lemeshow test was used. The Hosmer-Lemeshow test statistic measures the correspondence of the actual and predicted values of the dependent variable. A better model fit was indicated by a smaller difference in the observed and predicted classification (Hair, Anderson, Tatham, & Black, 1998). The significance of the test was assessed by a chi-square distribution. A good model fit was indicated by a nonsignificant test result (Hair, Anderson, Tatham, & Black).

Results

Description of Participants

During Spring 2007, there were 899 students enrolled in 37 online courses at the selected theological institution. Of the 899 students who were enrolled in online courses at the selected theological institution during Spring 2007, there were 706 males (79%) and 193 females (21%). At the end of the semester, 712 (79%; 563 male, 149 female) students passed the online courses and 187 (21%; 143 male, 44 female) students failed the online courses.

Descriptive Statistics for Independent Variables

According to the descriptive statistics (minimum, maximum, mean, and standard deviation) for the three quantitative, independent variables (age, previous online courses, and current online courses), students who failed the online courses were slightly younger than those who passed the online courses. Furthermore, the students who passed the online courses had

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more experienced taking online courses than those who failed and they took fewer courses during the current semester than those who failed. According to the descriptive statistics for the five categorical, independent variables (ethnicity, gender, marital status, financial assistance, and student status), more males enrolled in and passed the online courses than did females and more Caucasians enrolled in and passed the online courses than did any other ethnic group. Furthermore, no Hispanics failed any online courses taken. The descriptive statistics also show that more married students enrolled in and passed the online courses than did any other group. Furthermore, no widows failed any online courses taken. In addition, more students who received financial assistance enrolled in and passed the online courses than students who did not receive financial assistance and more part-time students enrolled in and passed the online courses than did full-time students.

Histograms (Figures 1 – 3) for the quantitative, independent variables are presented below. “A histogram is used to indicate frequencies of a range of values. A histogram is used when the number of instances of a variable is too large to want to list all of them” (George & Mallery, 2006, p. 84). Figure 1 shows a clearly-defined peak in reference to age for students who passed the online courses and students who failed the course. The peaks in both instances are fairly close in value to the mean. There are no obvious outliers with this particular quantitative variable.

Figure 1. Histogram for Age

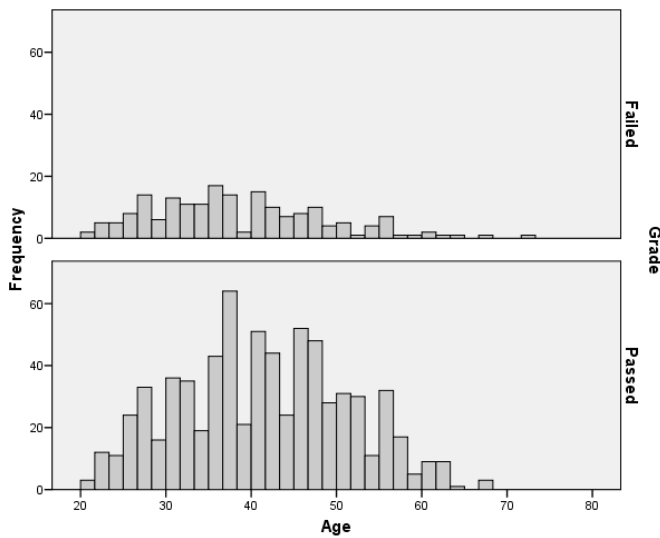


Figure 2 shows a clearly-defined peak in reference to previous online courses for students who passed the online courses and students who failed the course. The peaks in both instances show a high percentage of students who had no previous experience taking online courses. There are no obvious outliers with this particular quantitative variable.

Figure 2. Histogram for Previous Online Courses

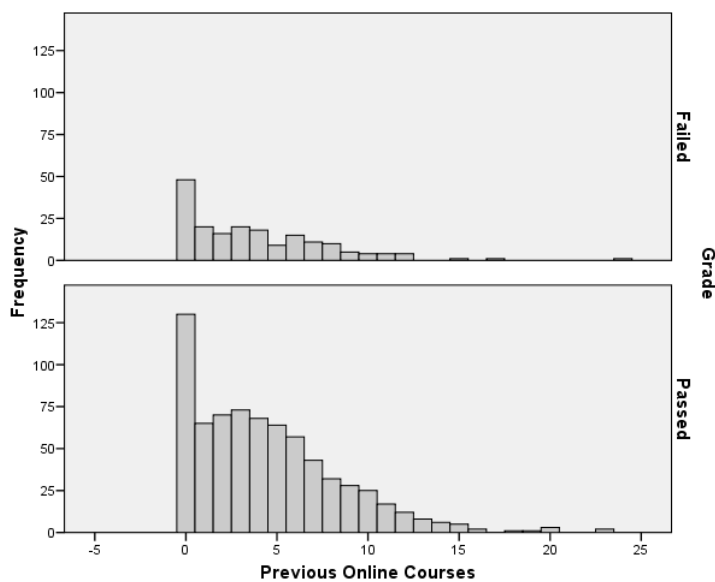
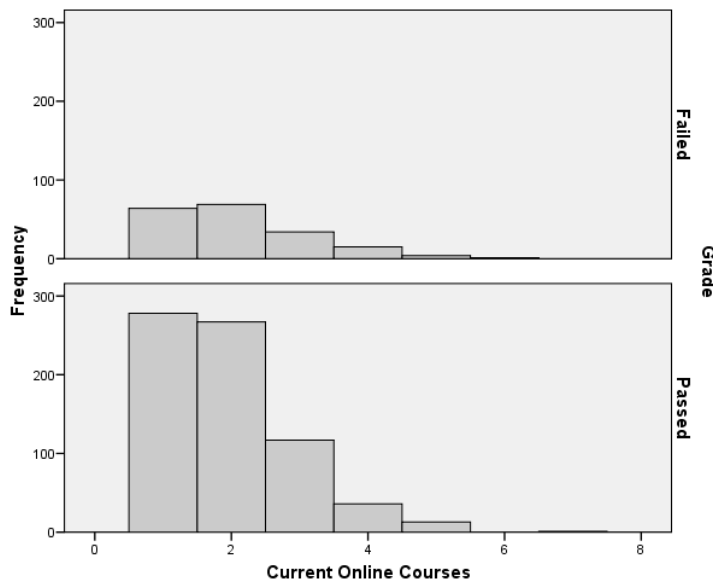


Figure 3 shows a peak in reference to current online courses for students who passed the online courses and students who failed the courses which is not as clearly defined as the peaks in Figures 1 and 2. The peaks for students who passed the online courses and students who failed the courses are fairly close in value to the mean. There are no obvious outliers with this particular quantitative variable.

Figure 3. Histogram for Current Online Courses



Bar graphs (Figures 4 – 8) for the categorical, independent variables are also presented below.

Figure 4. Bar Graph for Gender

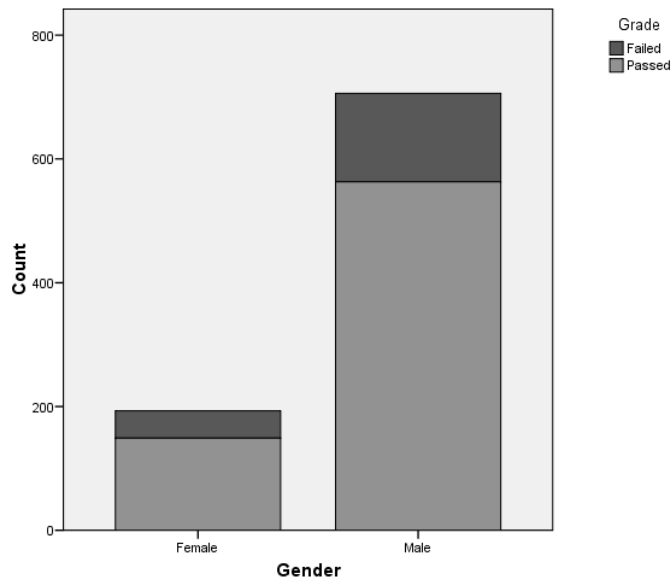


Figure 4 shows that the majority of students who enrolled in and passed the online courses were male.

Figure 5. Bar Graph for Ethnicity

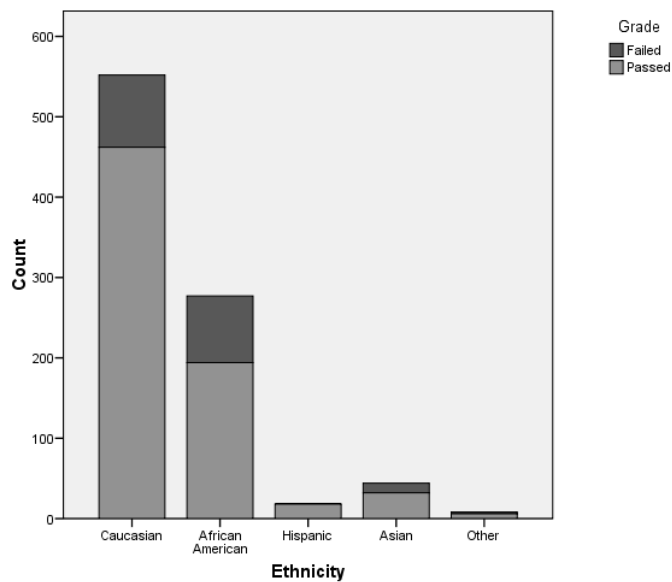


Figure 5 shows that the majority of students who enrolled in and passed the online courses were

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Caucasian.

Figure 6. Bar Graph for Marital Status

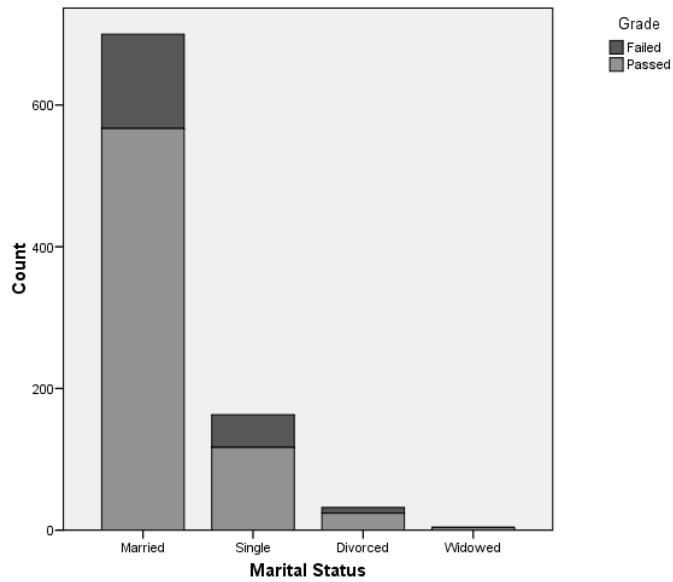


Figure 6 shows that the majority of students who enrolled in and passed the online courses were married.

Figure 7. Bar Graph for Financial Assistance

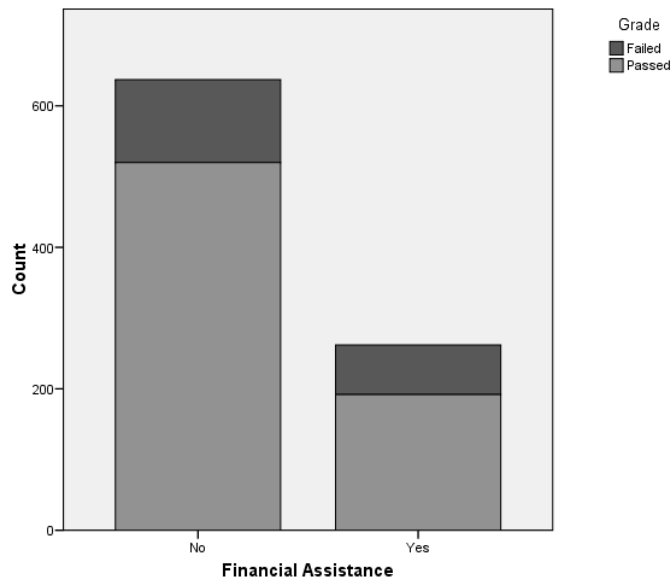


Figure 7 shows that the majority of students who enrolled in and passed the online courses received financial assistance.

Figure 8. Bar Graph for Student Status

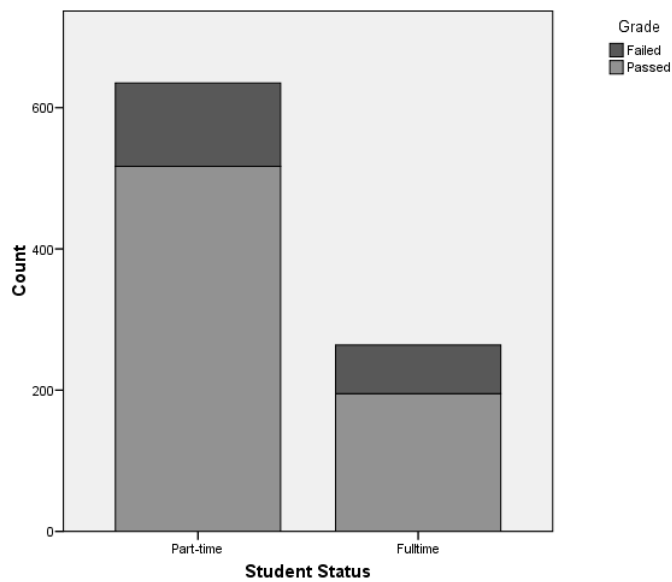


Figure 8 shows that the majority of students who enrolled in and passed the online courses were enrolled part-time.

Multicollinearity

One of the first steps in conducting a logistic regression was to check for multicollinearity. The measures which were utilized to assess collinearity were the tolerance value and the variance inflation factor (VIF) (Hair, Anderson, Tatham, & Black, 1998).

When performing the descriptive analysis on the eight independent variables, it was discovered that no Hispanic and no widowed students failed any of the online courses. This observation caused a problem for conducting a logistic regression. To resolve this problem, the Hispanic and the Other categories were combined for ethnicity and the divorced and widowed categories were combined for marital status. New variables for ethnicity (“ethnicity2”) and marital status (“marital2”) were created as follows:

“ethnicity2”: (1 = Caucasian; 2 = African American; 4 = Asian; 6 = Hispanic or Other)

“marital2”: (1 = Married; 2 = Single; 5 = Divorced or Widowed)

To assess multicollinearity (i.e., interdependence) among the independent variables, an ordinary multiple-regression analysis was conducted. In so doing, both “ethnicity2” and “marital2” variables were converted into sets of indicator variables (variables that take on only 0s and 1s). For example, for “ethnicity2,” the indicator variables were:

$U_1 = 1$ if Caucasian

$U_1 = 0$ otherwise

$U_2 = 1$ if African American

$U_2 = 0$ otherwise

$U_4 = 1$ if Asian

$U_4 = 0$ otherwise

No indicator variable was created for the Hispanic-or-Other category because this group can be defined by setting all three U s to zero.

A multiple-linear regression was conducted to compute the variance inflation factors (VIFs). The dependent variable, grade, was used for the purpose of assessing multicollinearity (i.e., VIF values do not change regardless of what dependent variable is selected). All VIFs are less than the conventional criterion value of 10. This suggests that there is no significant interdependence among the independent variables.

Logistic Regression

Logistic regression analysis was performed to determine whether or not any of the eight independent variables influenced the dependent variable. “Logistic regression is used to predict a dichotomous criterion variable from a combination of several independent variables. Logistic regression also involves a situation where the criterion variable is categorical. In addition, logistic regression analysis is used when some or all of the predictor variables are categorical” (Gliner & Morgan, 2000, p. 300).

Model Selection

A logistic regression analysis was conducted using grade as the dependent variable and age, gender, ethnicity2, marital status2, financial assistance, previous online courses, current online courses, and student status as the independent variables. A backward-elimination method was used to select the best predictors of grade. A significance level of 0.05 was used for the removal of the least significant variable at each step. The backward-elimination method removed a total of five independent variables, which were marital status2, gender, current online courses, financial assistance, and student status, in that particular order. The independent variables which

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remained in the model were age, ethnicity², and previous online courses. Both age and ethnicity² have p -values near zero, indicating that these variables have large degrees of contributions in the current logistic regression model. The p -value for previous online courses was .018.

The logistic regression model utilized in this study, with three predictors, was:

$$\ln\left(\frac{P}{1-P}\right) = \alpha + \beta_1x_1 + \beta_2x_2 + \beta_3x_3.$$

With the obtained estimates for the parameters, the fitted model was as follows:

$$\ln\left(\frac{\hat{P}}{1-\hat{P}}\right) = 0.811 + 0.037(\text{age}) + 0.054(\text{preonline}) \\ - 0.832(\text{caucasian}) - 1.772(\text{africanamer}) - 1.425(\text{asian}).$$

To illustrate this fitted model, for a 35-year-old Caucasian person who has previously taken 6 online courses, the estimated log-odds of passing the course were:

$$\ln\left(\frac{\hat{P}}{1-\hat{P}}\right) = 0.811 + 0.037(35) + 0.054(6) \\ - 0.832(1) - 1.772(0) - 1.425(0) = 1.598.$$

Therefore, the estimated probability of passing the course for this person was:

$$\hat{P} = \frac{\exp\{1.598\}}{1 + \exp\{1.598\}} = 0.832.$$

Because this probability was greater than 0.5, this person would be classified as passing the course.

Predictive Power and Model Fit

One way to assess the fit of a model is to examine its predictive power. This may be done by considering the model's correct classification rate. Based on the current model, 711 out of the 712 individuals who passed the online courses were classified correctly as passing. Thus, "sensitivity" was $711/712 = 99.9\%$. However, only 2 out of the 187 individuals who failed the

online courses were classified correctly as failing. Thus, “specificity” was $2/187 = 1.1\%$. “False positive” was $185/896 = 20.6\%$, and “false negative” was $1/3 = 33.3\%$. The overall rate of correct classification was $713/899 = 79.3\%$.

It is evident that the current model classifies individuals who passed the course well but not those who failed the course. This was due, in part, to the fact that the number of individuals who failed was very small in the data (only 20.8% of the total sample size).

The current model classifies a large number of individuals as passing and a very small number of individuals as failing the online courses. Thus, one may use the cut value of 0.75 instead of the conventional 0.5. By using this higher cut value, “sensitivity” is $527/712 = 74.0\%$, “specificity” is $79/187 = 42.2\%$, “false positive” is $108/896 = 17.0\%$, and “false negative” is $185/264 = 70.1\%$. The overall correct classification rate is $606/899 = 67.4\%$.

In addition, a Hosmer-Lemeshow test was conducted to assess the fit of the current model. The null hypothesis for the Hosmer-Lemeshow test was “ H_0 : Model fits,” and the alternative hypothesis was “ H_1 : Model does not fit.” For the current model, the result of the Hosmer-Lemeshow test was $\chi^2(8) = 9.592$, $p = 0.295$. At the 0.05 level of significance, this test was nonsignificant, which indicates that there was no substantial evidence of lack of fit.

Discussion

The results of the findings supported the research hypothesis which stated that there was a relationship between some of the selected variables (age, gender, ethnicity, marital status, financial assistance, student status, number of previous online courses, current online course load) and grade achievement of nontraditional, online students at the selected institution. A logistic regression, backward-elimination method was utilized to determine which of the eight independent variables were the best predictors of grade achievement. A p -value of $p < .05$ was

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utilized to determine the removal of the least significant variables. Five of the variables (gender, marital status, financial assistance, student status, and current online course load) had p -values greater than .05 and thus were removed from the model. Three of the eight independent variables (age, ethnicity, and number of previous online courses) were found to have a statistically significant relationship with the dependent variable (grade achievement). Age and ethnicity had p -values near zero, indicating that these variables had large degrees of contribution in the current logistic regression model and number of previous online courses had a p -value of .018. In addition, approximately 79% of the students enrolled in the online courses for the selected semester were male and approximately 21% were female.

This research sought to discover whether certain variables influenced the grades of nontraditional, online students at a particular theological institution. Although online courses are becoming more popular with nontraditional students on university campuses, past research has shown that these students do not always have success in completing these type courses. High drop out rates among online students have been consistently reported on college and university campuses across the United States. By discovering the variables which may impede the academic success of nontraditional online students, theological institutions can develop policies and programs which can help these students consistently succeed.

Interpretation of the Findings

The research findings indicated that a student's age, ethnicity, and the number of previous online courses the student had taken has an impact on whether the student will pass an online course. In the model developed for this study, age had a strong association with grade achievement, having a positive slope coefficient of (+0.037). In general, this indicates that as a student's age increases, the likelihood that the student will pass an online course also increases.

Research results showed that the older students were more inclined to pass the online courses while the younger students were more inclined to fail the online courses. This finding concerning age was consistent with earlier findings by Didia and Hasnat (1998) and Wojciechowski and Palmer (2005). Didia and Hasnat found that “the older the student, the better the grade” (p. 105). Research conducted by Wojciechowksi and Palmer found that older students faired better in online courses than the younger students in that the older students received higher grades in the courses.

Furthermore, in the model developed for this study, ethnicity was also found to have a strong association with grade achievement among nontraditional, online students. Overall, ethnicity had a *p*-value near zero, indicating that this variable contributed greatly to the success of online students. This finding concerning ethnicity was consistent with earlier findings by Clayton and Cate (2004) and Strage (1999) who also found that an individual’s ethnicity impacted the person’s ability to pass an online course.

The research results also showed that the Hispanic/Other category (with a *p*-value of 0.019) had the highest percentage of students passing the online courses, followed by the Caucasian category, the Asian category, and the African American category. The slope coefficients for the indicator variables related to ethnicity were all negative (−0.832 for Caucasian; −1.772 for African American; −1.425 for Asian). The results indicate that these three ethnic categories of students were less likely to pass online courses compared to Hispanics/Other category of students. In particular, Hispanic/Other students were more likely to pass online courses than African American students. These results were supported by other studies by Clayton and Cate (2004) and Strage (1999) who also found that a particular ethnic group performed better than others in online courses. Clayton and Cate found that White and Hispanic

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students performed better than Asian students, while Strage found that White students performed better than Hispanic and Asian students.

Finally, the model showed that previous online course was the third variable which had a positive association with grade achievement among nontraditional, online students, having a positive slope coefficient of (+0.054). This finding suggests that the more previous experience a student has in taking online classes, the greater the likelihood of the student passing subsequent online courses. The research results showed that an overwhelming majority of the students who had previously taken a large number of online courses passed their current online courses. This finding concerning previous online courses was consistent with earlier findings by Duplin-Byrant (2004) and Wojciechowski and Palmer (2005). Wojciechowski and Palmer found that there was “a positive and statistically significant relationship between the number of previous online courses taken and the grade students received in online courses” (p. 14). Duplin-Byrant found that previous online courses had a positive association with student performance and, therefore, was identified by the researcher as a variable that could be used to distinguish which students would complete an online course.

Although logistic regression demonstrated that both age and previous online courses have a positive impact on whether or not nontraditional students would pass online courses, correlational analysis showed that these two variables are not significantly correlated with each other ($r(897) = -.006, p = .851$). Further analysis of these variables individually demonstrated that as the age of students increase, their chances of passing online courses also increase. Similarly, as the number of previous online courses increases, the probability of a student passing subsequent online course also increases.

Implications for Practice

As institutions of higher learning increase their understanding of how certain demographic and academic variables influence grade achievement, institutional administrators may discover ways to enhance their academic programs and student support services to overcome barriers which may hinder a student's success in online courses. In addition, the discovery of specific variables which may influence grade achievement of nontraditional, online students may also impact the way professors design online courses and the various teaching methods professors utilize when delivering online courses. "Instructor preparation, course development, instructor accessibility, and course monitoring are all critical elements of effective online courses" (McEwen, 2001, pp. 101-102).

The study results revealed that students between the ages of 20 and 34 did not fare as well as the older students when taking online courses. The study results also revealed that students who had taken four or fewer online courses were more likely to fail subsequent online courses. Students who are younger and/or have no previous online course experience may "lack the necessary independence and time management skills needed for persistence" (Wojciechowski & Palmer, 2005, p. 12). Based on these results, institutional administrators may want to consider whether it would be beneficial to require some form of online placement testing or possibly a prerequisite course related to online instruction and computer technology before allowing younger students and those students who have no previous online experience or very little online experience to enroll in online courses.

A standardized set of guidelines could be constructed that require attendance at an orientation session, or block a student from taking the online version at all (if a more traditional format was available). No one wants to prevent students from taking their

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choice of classes, but prerequisites are already in place for many higher education courses, and placement tests are commonly used to place students into remedial and other courses. Results from this study indicate that a set of uniform prerequisites could be created for online courses as well to help enhance student success rates. (Wojciechowski & Palmer, p. 13)

These measures may serve better to familiarize younger students as well as students who are new to online course work with the rigors of online study and provide these students with an opportunity to begin their online experiences with a greater chance of succeeding.

In reference to the ethnicity of students taking online courses, African-American students and Asian students did not perform as well as the Hispanics/Other and the Caucasian students. Institutional administrators may consider requiring all faculty members (full-time and adjunct) to incorporate an online component in all traditional, face-to-face courses offered by the university. Although this idea has been suggested by institutional administrators, it has not been made a mandatory requirement for all faculty members and therefore some traditional courses have been developed with no online component. Including an online component in all traditional, face-to-face courses may serve as a less intimidating introduction to the online environment for African-American and Asian students, provide a smoother transition into online course work, and possibly help these students perform better in future online courses.

Prior research has proven that not all students are suited for the online environment. Therefore, institutional administrators may want to consider providing additional training for academic counselors who provide academic counseling to students related to online courses. This training may assist academic counselors in helping students select the learning environment which is most appropriate for their learning needs. "With a variety of course venues available, it

is important to select the format that provides the greatest opportunity for each individual student” (Wojciechowski & Palmer, 2005, p.11).

Limitations of the Study

The current study had several limitations which must be mentioned. The study was limited to one theological institution with a majority student population of nontraditional students. Approximately 95% of the students enrolled at the selected institution were 25 years of age or older. Approximately 96% of the participants in the study sample were 25 years of age or older. The study was also limited to one dependent variable (grade achievement) and the following independent variables: age, gender, ethnicity, marital status, financial assistance, student status, current online courses, and previous online course. The participants in the study were limited to the students who enrolled in online courses at the selected institution during Spring 2007. This semester was selected because the institution had its highest online enrollment (899 students) in the institution’s history and the institution offered the highest number of online courses (37 courses) in its history. The sample size of the Hispanic/Other students can also be considered a limitation of the study. Even though the data suggest that Hispanic/Other students perform better than the other ethnic groups in online courses, given the small number of Hispanic/Other students included in the study, this could have occurred by chance. The study was limited to courses which were offered completely online, with no face-to-face component. No hybrid courses were included in this study.

Recommendations for Future Research

Based on the findings from this study, several recommendations are suggested for areas of future research related to nontraditional, online students. The majority of the participants in this study were part-time, nontraditional students. Future research should be conducted to

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determine if the findings from this study can be replicated in other theological institutions with full-time, traditional students. Approximately 21% of the students who enrolled in online courses at the selected theological institution during Spring 2007 failed the courses in which they were participating. A qualitative study should be conducted to determine the reasons students were not academically successful in these courses. Interviews conducted with actual online students could provide institutional administrators with factors related to online course failures from a student perspective. Approximately 23% of students who had no previous online course experience or very little online course experience failed the online courses in which they participated. Further research should be conducted to determine what factors caused these students to perform poorly in their initial experiences with online course work. Could the student's poor performance be related to a lack of computer skills, a lack of motivation (either internal or external), a lack of discipline, the structure of the online course, or some other factors?

Moreover, the study results revealed that the performance of African-American students and Asian students in online classes was not equivalent to the performance of Hispanic/Other and Caucasian students. Further research should be conducted to determine if there are any problems specific to these two ethnic groups such as language barriers which may hinder their success in online courses. The study results revealed that older students perform better in online courses than younger students. Further research should be conducted to determine if the maturity level of the students significantly impact their success in online courses. Further research should also be conducted to determine if the older students were graduate or undergraduate students. Online courses traditionally have high drop out rates. For the past five years, the selected institution has had an average online drop out rate of 13.22% per semester in its online courses. Further research should be conducted to determine if there is a relationship between the

institution's online drop out rate and the academic and/or career goals of the online students. The retention of online students is a prevailing concern at most institutions. Given the size of the student body at this particular theological institution, the retention of its students, in particular its online students, should be of utmost importance.

Conclusion

This study was a four-month study of nontraditional, online students at a theological institution located in the southeast region of the United States. Overall, the results of the research conducted in this study may have important implications for online education and nontraditional students. Determining which variables impact the success of online students can assist online faculty in designing online courses as well as assist them in selecting the best teaching methods to utilize when delivering online courses. In addition, the research results can assist the selected institution in designing academic programs and students support services which may help online students continue to achieve. Although the findings from this study do not fully explain all the reasons why nontraditional, online students do not always succeed in online courses, the findings from the study do help advance the research in this area, especially as it relates to theological institutions.

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