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Student variables as a predictor of E -course completion

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Student Variables as a Predictor of E-Course Completion

Norma Hodge Thompson

**Dissertation submitted to the
College of Human Resources and Education
Of West Virginia University
In partial fulfillment of the requirements
For the degree of**

**Doctor of Education
In
Higher Education Administration**

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**Morgantown, West Virginia
2001**

**Keywords: E-course Completion, Student Variables
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ABSTRACT

STUDENT VARIABLES AS A PREDICTOR OF E-COURSE COMPLETION

By Norma Hodge Thompson

The purpose of this study is to determine student variables that predict E-course completion. Research questions were defined for investigating the relationship between student demographics and E-course completion. Student demographics include age, gender, GPA, student major, access to technology and employment. The student demographic variables were correlated with course completion and through logistic regression were determined to be predictors of E-course completion. The research population for this study was 3453 Marshall University students enrolled in E-courses from the spring semester of 1998 through the fall semester of 2000. Data for the study was obtained from the Marshall University Institutional Research Board. The data was coded to ensure confidentiality of the students as described in the Family Education Rights to Privacy Act (Buckly Amendment) (1998). The analysis of the data indicates that age, gender and GPA are student demographics that are positively correlated with E-course completion and they are predictors of E-course completion as single variables and as a cluster of all three variables. Student major was categorized into seven distinct groups that represent the colleges within Marshall University. These categories include the College of Business, the College of Education, the College of Liberal Arts, the College of Science, the Community & Technical College, the College of Fine Arts and the Graduate College. The student major categories incorporated in the College of Business, the College of Science and the Graduate College proved to be indicators of E-course completion. The data for the student attributes of access to technology and employment were computed from a randomly selected sample selected from the original population ($n = 555$). The analysis of the data reveals that access to technology and employment are correlated with E-course completion and are also significant indicators of student success. Ancillary findings relating Regents, B.A. and graduate students to E-course completion were also analyzed within the study and found to be significant predictors based on the identified student demographics.

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TABLE OF CONTENTS

CHAPTER	PAGE
ABSTRACT.....	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
CHAPTER I	1
Introduction	1
Background.....	1
History of Distance Education	2
The Internet	3
Advantages of E-courses.....	7
Disadvantages of E-courses	9
Web-CT and Marshall University	13
Predictors of Student Completion of E-courses	16
Age	16
Gender	18
GPA.....	20
Student's major	20
Access to Technology	22
Employment	24
Statement of Problem.....	25
RESEARCH QUESTIONS	25
OPERATIONAL DEFINITIONS.....	26
Significance of Study	27
LIMITATIONS AND ASSUMPTIONS.....	29

Summary	30
CHAPTER II	32
Review of the Literature	32
Introduction to Distance Education.....	32
Advantages of E-Courses.....	47
Disadvantages of E-courses	51
PREDICTORS OF COMPLETION	60
Age	61
Gender	63
GPA.....	65
Student's Major	66
Access to Technology	67
Employment	69
Summary	70
CHAPTER III	76
Methodology	76
Population and Sample	76
Design	78
Validity	80
Data Analysis	80
SUMMARY	82
Chapter IV	83
Presentation and Analysis of the Data	83
Descriptive Data	84
Major Findings	85
Research Question One	85
Research Question Two	87

Research Question Three	88
Research Question Four	89
Research Question Five.....	91
Research Question Six	93
Regression Analysis.....	93
ANCILLARY FINDINGS.....	97
Summary of the Chapter	99
Summary of Study, Conclusions and Recommendations.....	101
Purpose of the Study	101
Summary of Procedures	102
Descriptive Data	103
SUMMARY OF FINDINGS.....	104
Ancillary Findings.....	107
CONCLUSIONS	109
Ancillary Findings.....	112
Discussion.....	113
Implications.....	116
Limitations and Recommendations for Further Research.....	118
Limitations of this Research.....	118
Suggestions for Future Research.....	119
REFERENCES	123
APPENDIX A.....	138

LIST OF TABLES

TABLE	PAGE
Table 1. Frequency Statistics for E-course Grades (N = 3453)	86
Table 2. Frequency Statistics for E-course Completion (N =3453).....	86
Table 3. E-Course Descriptive Statistics for Age, GPA and Course Grade (N=3453)...	87
Table 4. Frequency Statistics for the Gender Variable (N=3453)	87
Table 5. Correlation Between Age and Gender and Completion (N = 3453).....	88
Table 6. Frequency Distribution of Student Major Categories (N=3453)	89
Table 7. Correlation Analysis of Student Major and Completion Based on College Categories (N=3453)	90
Table 8. Frequency Distribution for Access to Technology (n=555)	92
Table 9. Frequency Distribution for Employment (n=555)	92
Table 10. Correlation Analysis of Access to Technology and Employment with E-Course Completion (n=555)	92
Table 11. Summary of Regression Analysis for Age, Gender and GPA as Individual Predictors of E-course Completion (N=3453).....	95
Table 12. Summary Regression Analysis for Age Gender and GPA (Cluster) as Predictors of E- course Completion (N=3453).....	95
Table 13. Summary of Regression Analysis for Student Major Categories (N= 3453) ..	96
Table 14. Summary of Regression Analysis for Age, Gender, GPA and Student Major Categories (N= 3453).....	96
Table 15. Summary of Regression Analysis for Access to Technology (n=555).....	97
Table 16. Summary of Regression Analysis for Employment (n=555).....	97
Table 17. Summary of Regression Analysis for Access to Technology and Employment (Cluster) (n=555)	97
Table 18. Correlation Analysis of Regents, B.A. to E-course Completion (n=302).....	98
Table 19. Summary of Regression Analysis for Regents BA Student Major (n=302)	98

CHAPTER I

Introduction

Background

Higher education has experienced a transformation in the delivery of student course work that is based on the integrated use of telecommunications and computer technology (Becker, 1999; Charp, 1998; Enright, 1999; Greengard, 1999; Nixon & Leftwich, 1998; Miller & Jones, 1999; Rawls, 1999; Teh, 1999; Van Dusen, 1997; Weber, 1999). Obtaining a college degree no longer requires a student to physically attend a university or college campus. Distance education applications through electronic transmission have established a new relationship between professor and student that promotes access to higher education. Electronic courses (E-courses) have increased in popularity, with most major colleges and universities utilizing computer technology as a form of distance learning. This form of education provides the non-traditional student with the benefit of a flexible format with fewer time constraints in meeting the course requirements of the institution (Hitchcock, 1999; Jackson, 1999; Kerka, 1996; Murphree, 1999; Nixon & Leftwich, 1998). To meet the needs of a growing population of non-traditional students, universities and colleges will be required to embrace the concept of E-courses and provide the necessary technology for this type of course delivery (Fender, 1999).

There are several advantages and disadvantages to electronic form of course delivery that will be discussed in this study. One disadvantage that has been questioned by educators is the high non-completion rate associated with these courses. Non-completion of E-courses is an issue that must be analyzed and addressed to ensure the quality of distance education programs. If traditional education can be assessed through the constructs of age, gender, GPA and student

major, then E-courses should be analyzed through the same criteria. Higher education institutions must also be aware of the non-completion rate associated with this form of delivery and assess those students that have been successful in completing the required course work.

History of Distance Education

Distance education is the process of providing improved access to education through several possible delivery systems (Jamlan, 1999; Miller & Jones, 1999; Van Duesen, 1997). These systems of delivery include correspondence study, interactive television, and electronically delivered Web-based courses. The fundamental aspect of this concept is the instruction of students who are separated from the instructor by some geographical distance (Freedman, 1999; Spooner, Algozzine, Spooner & Melba, 1998). Distance education can be viewed as a vital force in American education in terms of economic, political, and pedagogical issues (Jamlan, 1999; Matthews, 1999). This type of education has gained popularity because it is more flexible for students, instructors and the institution (Spooner et al., 1998). Advancements in technology and a rise in the number of non-traditional students has been instrumental in providing more sophisticated delivery systems and new concepts in providing education (Fender, 1999; Tweney, 1999). Technology expands the range and quality of content that is utilized in the educational process (Green, 1999).

Distance education is not a new concept in the delivery of information and education. In the past, access to higher education was limited because of geographic distance between higher education institutions and rural populations. Students not served by higher education institutions turned to other sources for learning and knowledge. Attempts to provide distance education dates back to the 18th century, when communication between the instructor and the learner was disseminated through the mail system (Abernathy, 1999; Fender, 1999; Matthews, 1999;

Yudkowsky, 1998). Correspondence study expanded in the 19th century to allow students to receive instruction without attending the traditional classroom. In 1892, Pennsylvania State University introduced a program of correspondence study that allowed delivery of courses to rural students that was viewed as the “Information Highway” of the 19th century (Banas & Emory, 1998). In 1874, Illinois Wesleyan University offered graduate and undergraduate degrees through correspondence courses (Fender, 1999).

An expansion of distance education through radio and television media including the interactive classroom occurred in the 20th century (Abernathy, 1998; Anderson, 2000; Ballon, 1999). Independent and home study were two other means of distance education that became popular to learners who wanted to complete course work off campus with limited instructor supervision (Spooner et al., 1998). Today, technology continues to expand access to education with methods of delivery that include audiotapes, CD-ROMs, videotapes, and satellite-based training (Abernathy, 1998; Smith, 1998; Van Duesen, 1997).

The Internet

The Internet has surfaced as a catalyst, attracting colleges and universities to the concept of distance learning in the form of online courses. The Internet was first developed in 1969, through funding by the Department of Defense. The Advanced Research Projects Administration NET (ARPANET) was developed to exchange defense-related information (Charp, 1999b; Hankin, 1999b). The Internet became available to television networks and satellites in 1979. In 1989, the World Wide Web (WWW) was created and shortly after that the first graphical browser, Mosaic, was developed that allowed for easy navigation of the Web (Charp, 1999b).

The Internet has expanded the boundaries of the classroom through online learning that is independent of time and location (Doucette, Ferran & Mingle, 1999). The World Wide Web is

that portion of the Internet used to transmit data in a series of interconnected pages that include text, graphics, sound, and video (Merisotis & Phipps, 1999). The Internet has become an alternative to the traditional classroom providing opportunities to students who otherwise would have limited or no access to higher education (Fender, 1999). During the last decade, emphasis on the use of microcomputers in providing quality and effective distance education has emerged (Dede, 1990). Thirty years ago, only three computers were termed “hosts” that could be directly reached through the Internet. Today that number has grown to 43.2 million and is expected to increase to 100 million by the year 2001 (Hankin, 1999b).

Technology has proliferated distance-learning programs, providing courses and entire degrees through a framework of electronic media. Fueled by greater power and the advancement of fiber optics, technology has provided for the increased capabilities of computers and telecommunications, leading the way in distance education (Hankin, 1999b). The Internet continues to grow as a technology-based alternative to course delivery that is used by many colleges and universities throughout the world. This has opened the market to software developers, telecommunication companies, hardware manufacturers, Web providers, and servers of technology and education-based services. Courses can be developed and delivered through this mode of technology providing worldwide access to education (Becker, 1999; Chang, 1998; Merisotis & Phipps, 1999; Smith, 1998).

In 1997, Peterson’s Distance Learning Guide listed 762 cyber-colleges with more than one million students enrolled in courses through these institutions (Hankin, 1999a). According to research, enrollment in this form of distance learning is projected to reach 2.2 million by the year 2002. It is also projected that approximately eighty-five percent (85%) of all higher

education institutions will offer this form of distance learning by the year 2002 (International Data Corporation, 1999).

Computerized classrooms, otherwise known as electronic courses (E-courses), have been developed and are online for many universities. The idea behind electronic courses stems from the concept of distance learning, where students can obtain an education without attending class at the physical campus. E-courses provide education through a one hundred percent (100%) totally remote system of electronic delivery. These courses require a great deal of motivation, dedication, and the ability to utilize a textbook as the main source of information (Morris, B., 1999; Murphree, 1999). This type of course delivery is said to be appropriate for traditional and non-traditional students in pursuit of undergraduate degrees, advanced degrees or generalized continuing education (Charp, 1998; Larsen, 1999).

Another methodology associated with distance education via the Internet is the T-course format. This mode of delivery is differentiated from the E-course offering in that there is an occasional class meeting, which allows for instructor- student visual interaction. The T-course also uses remote delivery for at least eighty percent (80%) of the course content. Students may also be required to attend some on-site class meetings to complete the course. These meetings may be in the form of laboratory sessions, a discussion session, an oral presentation, or any other requirement of the course that does not fit in an E-course format. Prerequisites for -courses do not need to be available in E-course or a T-course format (Orientation to MU Online, 1999).

Electronic courses (E-courses) are traditional-based courses that are accessed through Internet technology. It is possible to create a collaborative virtual classroom through the use of white boards, threaded discussions, and a variety of course material delivered through a computer modem and a Web browser (Farrington, 1999; Kontos, 1995). Distance learning

implies there is non-contiguous communication between the learner and the instructor, which supports the notion of a unique source of course delivery (Gibson, 1991; Miller, 1999). There are, however, Web tools that permit synchronous communication that allows for live video and audio to be carried over the Internet (Charp, 1998). This form of delivery continues to improve and expand with advancements in technology (Ballon, 1999; Becker, 1999; Morris, K., 1999; Nixon & Leftwich, 1998).

Many public and private institutions have incorporated the technology in their curriculum and are providing degree and certificate programs via the Internet. Duke University, Massachusetts Institute of Technology and Stanford University have joined the cyber age and are currently offering E-based Master's and certificate degree programs (Charp, 1998). Other institutions including the Western Governors University, the National Technological University, and the University of Phoenix have provided distance learners access to education through the Internet (Epper, 1999; Farrington, 1999; Gotschall, 1996; Macht, 1998; Morris, B., 1999).

The emphasis of this study is to analyze a problem that is inherent to this independent style of education. E-courses are based on the premise that students learn best in their own personal way. While there is increased interest and attention to distance learning in higher education, areas of concern exist that must be acknowledged and addressed by all stakeholders. With the advantages of E-courses and the number of students who register and attempt them, it is surprising that many students who register for this type of education never complete the course work (Carr, 2000). Research in the field of distance education, specifically E-courses, indicates that there is approximately a fifty percent (50%) or higher non-completion rate with these types of courses (Carr, 2000; Merisotis & Phipps, 1999; Ziegler, 1999). The literature suggests that there is a level of motivation and desire to complete E-courses that can be attributed to the

successful student (Kirkeby, 1999; Parrott, 1995). This issue of non-completion will be explored in terms of the variables of age, gender, GPA, student major, access to technology and employment. First, before these variables are analyzed in depth, the advantages and disadvantages to E-courses should be discussed.

Advantages of E-courses

Online courses offer several advantages in providing education through a technology-oriented learning process. E-courses can overcome the limits of time and geography and reach students that might not be served by a traditional campus education. This form of learning frees the learner from time and place constraints and is able to meet the student's specific needs and interests (Chang, 1998; Eastmond, 1998; Farber, 1998; Hassenplug & Harnish, 1998; Hitchcock, 1999; Jamlan, 1995; Matthews, 1999; Miller & Jones, 1999). Students have the capability to work at their own pace and at their own time. This means that a student can complete course work at any hour of the day or take an examination in the middle of the night. There is also better quality control over course materials because students can choose the subjects, materials, and the methods necessary to learn. E-courses are also thought to overcome inadequacies in meeting learners' needs because of the ethnic, linguistic, and cultural variance that is typical of the American population (Dede, 1990; Willis, 1992).

Universities and colleges must be open to the Internet as a source of educational resources and as a method of delivery (Chang, 1998; Matthews, 1999). To be competitive they must incorporate the use of the technology while maintaining product quality. The key to the successful college of the future is not in the product but in the mode of the delivery (Freedman, 1999). E-courses have been shown to have positive impact on the university as a whole. Through development and implementation, these courses, have been shown to improve staff

development and to lower institutional costs (Abernathy, 1999; Jamlan, 1995; Matthews, 1999). Internet-based education offers independent learning opportunities, better quality control over course materials, and an improvement in pedagogic quality. Distance learning in all formats has been described as an inexpensive way for rural universities to increase course offerings and provide education to a larger proportion of the population (Abernathy, 1998; Macht, 1998; Willis, 1992).

“...Indeed, the Internet, and the technology which supports it may well constitute the third modern revolution in higher education. The land-grant movement in the Nineteenth Century brought access to higher education to the middle class. The community college movement of the Twentieth Century brought universal access to higher education. The technology revolution of the Twenty-first Century can bring access to all beyond the bounds of time and place” (Teaching at an Internet Distance, 1997, p. 3).

The academic effectiveness of E-courses has been questioned as to quality and content of course material. In the past, some forms of distance learning were perceived as “diploma mills,” instilling a negative academic reputation (Emmons, 1999; Geber, 1999). Credibility with E-course offerings has been substantiated through programs developed by universities and institutions with established reputations (Freedman, 1999). This promotes a sense of quality and integrity to the program. The question of quality can be assessed through the observation of several factors. Studies indicate that cognitive factors (amount of learning, performance, achievement, examinations, and the assignment of a grade) are rated basically the same for E-courses as for traditional courses (Spooner et al., 1998). There are other factors that must be considered, including student satisfaction with the course, comfort level, convenience,

communication with the instructor, independence, and perception of effectiveness (Spooner et al., 1998).

Regardless of these factors, research indicates there is not a significant difference between distance delivery methods and traditional learning (Charp, 1999a; Farber, 1998; Fender, 1999; Gubernick & Ebeling, 1997; Merisotis & Phipps, 1999; Hiebert, 1999; Smith, 1998; Spooner et al., 1998; Szulc, 1999). Student performance, as measured on achievement-type tests, indicates that alternative methods of delivery are comparable to the traditional classroom (Ritchy & Newby, 1989). When the technology is appropriate to the course content, the delivery method seems to have little impact on student achievement (Banas & Emory, 1998; Smith, 1999). There is even evidence that indicates E-course students are more resourceful and develop better writing and communication skills (Elias, 1999; Freedman & Cooper, 1999; Hiebert, 1999; Mulligan & Geary, 1999).

Disadvantages of E-courses

Regardless of the enthusiasm associated with E-course delivery, there are prevailing concerns about Internet-based courses and programs (Arbaugh, 2000). Education administrators, relative to the social context of higher education, have questioned this form of delivery. Learning can be viewed as a process, not a place (Fisher, 1999). Nevertheless, some educators view education as a social process with the context as an important aspect of the college experience (Charp, 1998; Farber, 1999; Fender, 1999; Green, 1999; Merisotis & Phipps, 1999). Some purists view higher education as a community of scholars physically brought together to live and learn (Macht, 1998). John Dewey's (1938) theory of learning and growth emphasizes learning and the educational process as both social and cognitive. The college experience, including interaction with faculty and peers, has been said to contribute to the integrated effects

of the education process. Student involvement in the campus community and the associated environmental factors appear to influence student development and the overall educational outcome (Farber, 1999; Fender, 1999; Matthews, 1999; Tweney, 1999). Students who utilize online delivery are independent learners that may be compromising on the maturing and socializing component of a college education (Teaching at an Internet distance, 1999).

The quality of E-courses also has been questioned as to effectiveness and the degree of interaction. Internet courses are delivered through modern technology that eliminates the interaction and face-to-face communication between instructor and student (Charp, 1999a; Farber, 1999; Hassenplug & Harnish, 1998; Van Dusen, 1997). A compelling argument against E-course delivery can be made in reference to the issues of limited interaction and communication (Young, 2000; Tweney, 1999). Frequent student-faculty interaction is said to be the most important factor in student motivation and involvement (Farber, 1999; Merisotis & Phipps, 1999). High quality online education requires strong student-faculty interaction (Freedman, 1996). Therefore, it can be concluded that student interaction with faculty has been determined to play a substantial role in the completion of E-courses. Effective communication is important because of the online environment, particularly because of the lack of voice and expression. Many students state they feel uncomfortable contacting a professor they have not physically met and will not seek the help that is necessary to complete the course. Subsequently, they face failure or non-completion (Farber, 1999; Matthews, 1999).

Distance education is not the best delivery method for all students. Students must be aware that even though the technology is exciting, this form of learning is not for everyone. Students may have interest in access to the technology, but not in the actual learning (Arbaugh, 2000; Doucette et al., 1999; Merisotis & Phipps, 1999). This form of education requires the

student to be learner-centered or student focused in order to achieve the benefits of independent learning (Fisher, 1999; Murphree, 1999; Yudkowsky, 1998). There must be some degree of motivation and ability for effective learning. There must be a “fit” between the student and the learning environment that stimulates the learning process (Carr, 2000). The quality of the “fit” with a particular class environment varies with the method of delivery. The American Distance Education Consortium (ADEC, 1999) has developed six guidelines that address the fit of online courses and the associated quality of education:

1. The learning experience must have a clear purpose with tightly focused outcomes and objectives.
2. The learner is actively engaged
3. The learning environment makes appropriate use of a variety of media.
4. Learning environments must include problem-based as well as knowledge- based learning.
5. Learning experiences should support interaction and the development of communities of interest.
6. The practice of distance learning contributes to the larger social mission of education and training in a democratic society (Teaching at an Internet Distance p30).

A comprehensive review of the literature suggests that students view E-courses as an easy alternative and may not realize the implications of taking a course on the Internet (Morris, K., 1999; Ziegler, 1999). Evaluative criteria to determine if students have the potential for success include age, gender, access to technology, major area of education and employment status (Matthews, 1999; Merisotis & Phipps, 1999). In determining the level of student satisfaction in distance education, factors such as age, gender and major were considered. These

are personal traits and characteristics that are considered fundamental for successful performance with E-courses (Miller & Jones, 1999; Wade, 1999). Banas and Emory (1998) suggest that course completion could be based on biases related to age, gender and socioeconomic status. This perpetuates the question of Web equity that addresses the same issues of gender, race, and socioeconomic status (Enright, 1999; Wright & Yates, 1999). Access to the technology and the ability to effectively communicate ideas are areas of concern in managing E-course completion. Studies linking these variables to completion of E-courses have been limited, with an indication for expanded research in this area.

The chief drawback in any form of self-learning is the level of self-discipline that students must have to complete the course. A higher level of self-discipline is demanded for these courses than for a traditional course of study. E-courses have been estimated to require 3-5 hours per week of study, homework, and online participation (Fisher, 1999; Miller & Jones, 1999). Students must create a level of structure in their life and their work to complete the course in the allocated time period. They must have internal motivation to create this structure (Jamlan, 1995; Macht, 1998). Those students who do not procrastinate and are highly motivated tend to be the students that complete the course. There is a linear relationship that exists between completion of E-courses and the time period required to initiate the course (Nixon & Leftwich, 1998). Students that are viewed as “busy” or “disorganized” have been shown to be less effective in this form of learning and exhibit a high dropout rate (Fisher, 1999). There are students who never log on the course and accept a failing grade, or they apply for time extensions and draw out the process for several semesters. These students usually drop out of the course and a few will eventually drop out of the university. The number of students who drop the E-course and register for the course in the traditional method has not been validated, but

studies are currently being conducted to assess the completion rate and how students deal with the inability to complete the online course (Matthews, 1999; Merisotis & Phipps, 1999).

There is evidence to support the theory that course and degree program completion rates via the Internet are substantially lower than traditional based programs (Carr, 2000; Merisotis & Phipps, 1999; Romiszowski, 1993). These studies suggest that factors of age, access to technology, employment and the student's area of study may be predictors of completion or non-completion of Internet courses. Students should have the opportunity to learn in any way possible; however, some educators believe there should be a process to discourage students who may be at risk of failure (Carr, 2000). Establishing a relationship of success through the variables discussed can be a factor in determining the type of student that will succeed with online education (Carr, 2000; Farrington, 1999; Merisotis & Phipps, 1999; Roblyer, 1999). Universities should evaluate students who register for E-courses and assess those students who have the ability to succeed with this form of learning. Those students who do not appear suited to an independent form of learning should be discouraged from this mode of course delivery (Banas & Emory, 1998; Hassenplug & Harnish, 1998; Miller & Jones, 1999).

Web-CT and Marshall University

The premise of E-courses is to provide a learning environment where the student is not required to physically be on campus or have any face-to-face contact with the faculty member. WebCT is a system of World Wide Web Course Tools that apply innovative technologies to facilitate course preparation and facilitate the student's learning experiences. WebCT is a major developer of educational electronic courses and delivers sophisticated Web-based courses through a suite of tools developed by the University of British Columbia (WebCT, 2000). WebCT is a leader in the field of Web-based learning that provides the faculty with the tools for

building online courses and the technology to connect students with the Web-based learning environment. WebCT, is presently being used by universities and colleges all over the world, to deliver online learning (Orientation to MU Online, 1999).

Marshall University, a major user of WebCT, will provide the data to be utilized in this study. The university is a regional university-south, second tier institution, located in Huntington, West Virginia. The main campus constitutes sixty acres that are located on the Ohio River and thirteen miles from the Kentucky border. The university is situated to provide higher education to Huntington and the surrounding tri-state area. The university also provides service to Logan and Mingo counties and the Point Pleasant area through the Southern Mountain Center, the Mid-Ohio Valley Center and the South Charleston-Teays Valley area (Marshall Best Value, 1999).

Marshall University is a medium sized university that is classified as a Masters (Comprehensive) University or College I as defined by the Carnegie Foundation for Education. The school is currently rated 3.2 on the academic reputation scale (5 being the highest rating). The academic reputation scale rates universities based on several criteria. These criteria include retention rates, acceptance rates, and number of full time faculty. (College View Facts, 1994). Marshall was also ranked in the Top 100 Best Wired Universities for 1999 and 2000. This ranking is based on criteria including computer accessibility, infrastructure and On-line capabilities (College Guide: America's Most Wired Colleges, 2000).

The university offers a full range of baccalaureate degrees and it awards 40 or more masters' degrees in three or more disciplines. The university is comprised of nine academic areas providing fifteen associate degree programs, 45 baccalaureate degree programs and 42 graduate degree programs.

Enrollment in 1998 was reported as a headcount of 16,000 students with 4,000 of these students enrolled in graduate programs. West Virginia residents comprise eighty-five percent (85%) of the institution and fifteen percent (15%) is a mixture of students from other states and countries. Thirty-six states and twenty-one countries are represented including students from China, Korea, Japan and India. The breakdown of the student population includes 0.4% Asian Indian or Alaska Native, 0.89% Asian or Pacific Islander, 4.3% Black, 0.44% Hispanic, and 94% white. The ratio of males to females is 47:53, which is typical of institutions similar to Marshall. Marshall accepts 91% of all applicants and maintains a 71% freshmen retention rate. Approximately 37% of the students meet graduation requirements and complete the degree process (College View Key Facts Database, 1998).

Marshall University prides itself as being on the cutting edge of new technologies and developments. The university is described as “the interactive university” and continues to provide the resources and intellect to maintain this position. As of 1998, investments in computers, fiber optic networks, and telecommunications have totaled \$50 million. It is one of the most technologically advanced institutions of its size and type in the country (Marshall Best Value, 1999).

Marshall’s role as an interactive university is supported through its distance-learning program. Marshall utilizes E-courses as a method of course delivery to meet the needs of the distance learner. The students that were considered as E-course participants at Marshall University were the non-traditional students who because of the time and place constraints could not take courses on campus. In order for students to be eligible for E-courses, they must have the same prerequisites required with the traditional based course. Prerequisites for an E-course must be available to the student in an E-course format through Marshall University or through the

Southern Regional Electronic Campus, of which Marshall is a member. Currently Marshall has 924 students enrolled in E-courses, with 98 of these students exclusively enrolled in E-courses (Marshall University Statistics on E-courses, 1997).

As of the fall semester 2000, Marshall University has 134 E-course sections. These courses are offered through the following colleges: Lewis College of Business, Community and Technical College, College of Education, College of Fine Arts, Graduate College, College of Liberal Arts, and College of Science. It is projected in the near future that technology will be used to support courses offered at the university via the Internet and an electronic degree is being considered as a possibility in the coming year. The Southern Regional Electronic Campus Board is anticipating the number of degree programs offered through the Electronic Campus to increase from 25 to 60 by the spring term and will include more program offerings. There will also be more graduate programs available and the number of certification programs will also continue to increase (Graves, 1997).

Predictors of Student Completion of E-courses

Age

The original intent of any distance education program was to provide non-traditional students the opportunity to complete course work without physical attendance on a college campus (Kerka, 1996). The non-traditional student is defined as the older corporate employee, government employee, stay at home parent, who may be taking courses for advancement in their field, to achieve a basic level of knowledge of a subject, or the completion of a degree (Becker, 1999; White, 1999). A profile of the general student involved with distance education is classified as over 26 years of age, highly motivated and goal oriented (Banas & Emory, 1998; Jamlan, 1999; Parrot, 1995; Romiszowski, 1993). Studies indicate that the average age of the

successful student is 28 years (Fender, 1999). The student population has increased in age with more than forty percent (40%) of all students over the age of 24 and twenty-five percent (25%) over the age of 30 (Davidow, 1999). The level of maturity and the element of age have been questioned as factors in E-course success. Students who are older and mature have been shown to have a higher rate of overall course completion, which includes E-courses (Teaching at an Internet Distance, 1999). These students are said to have the necessary academic maturity that is evidenced by critical thinking and the ability to synthesis different areas of knowledge (Teaching at an Internet Distance, 2000).

The University of Phoenix provides online computer mediated education to students all over the United States and the world. Their admission requirements specify that students must be at least 23 years of age to participate in their E-course program (Freedman, 1999; Gubernick & Ebeling, 1997). They have reported higher completion rates with sixty percent (60%) of their students graduating and receiving a degree (Phoenix on Line, 1999). Older students are viewed as more mature and tend to value their time, effort and money (Elias, 1999; Fender, 1999). These students are usually funding their own education and are aware of the associated opportunity costs of a college education. Older students have been found to be better equipped for the college learning experience than traditional younger students (Elias, 1999).

The major problems, observed in any E-course program, are the lack of motivation and self-discipline (Banas & Emory, 1998; Fisher, 1999; Hiebert, 1999). Younger students are said to lack the motivation or independence necessary to succeed with online courses (Hiebert, 1999). Research has shown that motivation is a function of the student's age, background, and intellectual capacity. Students usually procrastinate and justify their position with the opinion, "I have plenty of time" or "I will start the course when I am not so busy." Motivation and time

management are critical for success with an online class, it is easy to spend too little time on the class and procrastinate until completion is not an option (Carr, 2000; Elias, 1999; Fender, 1999; Fisher, 1999; Matthews, 1999; Miller & Jones, 1999; Murphree, 1999).

Younger students, typically lack maturity and the orientation to be a self-learner. (Farber, 1999; Hiebert, 1999). Studies conducted by Behm (1990) indicate that younger students value instructor motivation, course interaction and communication more highly than adult learners. An 18-year-old traditional student has different needs and expectations in terms of learning than a 45- year-old adult learner (Farrington, 1999; Green, 1999). Younger students benefit from an on-campus presence, which provides a basis for maturity and socialization. There should be some evaluative criteria to determine if students have the maturity and self-discipline necessary for success. Students that exhibit academic maturity are said to utilize critical thinking and they have the ability to synthesize different areas of knowledge, which is essential in a self-learning environment (Arbaugh, 2000; Berger, 1999; Fender, 1999; Murphree, 1999; Shrivastava, 1999; Willis, 1992; Wright & Yates, 1999).

Gender

Distance education has been shown to target women with children that aspire to careers and professions (Becker, 1999; Kontos, 1995; Matthews, 1999). Traditional based education creates situational barriers in terms of flexibility and scheduling (Kerka, 1988). Some findings indicate that most distant learners are working adults, primarily female (Roblyer, 1999). Women comprise sixty-six percent (66%) of the non-traditional population with eighty percent (80%) caring for a home and children (Becker 1999; Bremner, 1998; Matthews, 1999). Distance learning attracts women with children who cannot leave home to attend campus-based courses. These learners are committed to their families and are unlikely to leave their homes and their

family obligations to attend courses on a college campus (Hitchcock, 1999; Matthews, 1998; Miller & Jones, 1999; Parrot, 1995; Rowmiszowski, 1993). They are viewed as seekers of additional skills, retraining or in pursuit of a potential career (Weber, 1999). The multiple roles women fill contribute to their sense of being time bound. They are unable to fit traditional study into their overburdened schedules (Thompson & McGrath, 1999). E-courses allow women the opportunity to meet family and school obligations while completing course requirements (Weber, 1999). With the increase in the population of female students, it is important to note their impact on completion rates. Research conducted with traditional college students reveals higher non-completion rates associated with older minority women on welfare (Weidman, 1985). Other studies have shown that females, on an average, have lower degree completion rates than males (Avakian, 1984; Brawer, 1996).

Access to the technology is fundamental to success with E-courses. Although the number of Internet users has continued to grow, there is still a majority of the population without access, including single mother households (Bucy, 2000). Studies also indicate women continue to lag behind men in Internet usage, but they are likely to use home computers for educational purposes (Blum, 1999; Bucy, 2000). Nevertheless, statistics have shown that the typical student enrolled in an online course is female and unmarried (Richards, 1992).

There is theoretical evidence that suggests women and men conceptualize and utilize E-courses differently. Men view Internet delivered courses as a means of mass education with greater efficiency and less cost. In contrast women find E-courses as a collaborative and supportive environment of learning. Female learners tend to place emphasis on relationships, they are empathetic and prefer an environment that stresses cooperation rather than competition

(Blum, 1999). Furthermore, women have been shown to be more responsive to the coursework with higher levels of participation and more frequent online discussions (Arbaugh, 2000).

GPA

Previous attempts to assess the effectiveness of E-courses have examined the final grades or compared class averages with the traditional based course. Research indicates that students enrolled in Internet based courses tend to have a higher GPA than the traditional students (Sonner, 1999; Weidman, 1985). Persistence with college courses and completion rates of traditional based courses has been accurately predicted through grade point average (Brawer, 1996; Prather & Hand, 1986). The most significant predictor of student retention in traditional courses is semester GPA and overall GPA (Bean, 1982; Farabaugh-Dorkins, 1991; York, 1993; Mohammadi, 1994; Roweton & Bare, 1991).

A survey of students enrolled in an online program indicated that forty-one percent (41%) of the students had a grade point average above 2.5 (Richards, 1992). The University of Phoenix utilizes student GPA as a method of monitoring students' completion rates while enrolled in the online program. Moreover, students must maintain a certain grade point average to stay in the program and complete the online degree (Gotschall, 1996).

Student's major

Problems have also been noted in the curriculum of the E-course offerings. There is some question as to the suitability of certain courses for electronic delivery (Dixon, 1997). Courses that are complex in nature and require hands on problem solving may not be appropriate in E-course format. Statistics prove that these types of courses have a higher rate of non-completion than other courses and should be eliminated from the E-course listing (Hassenplug & Harnish, 1998). Some course work does not lend itself to self-learning measures and should be

taught in the traditional classroom setting (Kirkeby, 1999; Morris, 1999). Mathematically oriented courses may not be appropriate for E-course development, because of complex formulas and the time involved in the input of calculations. Consideration should be given to the work involved in the course and the difficulty in communicating information over the Internet. Formulas and equations with signs and symbols are difficult to input in a format that can be transmitted to the instructor. Student assignments must be “do-able” in a technology-based environment. To allow for student completion, the course must be properly designed in terms of structure, content and technology to provide for the desired results (Larsen, 1999).

Coursework may require the transformation of information that is considered overly technical or time consuming. The E-course format may not provide the proper media to adequately communicate thoughts and ideas. This makes the input of information difficult and time consuming (Kirkeby, 1999). Student's with a major area of concentration requiring this form of input may become frustrated resulting in non-completion of the course. These courses should be monitored relative to completion rate and student performance level, to determine non-suitability and elimination from the E-course offering (Hassenplug & Harnish, 1998). Courses requiring frequent socialization between the instructor and the student should be avoided as an online course (Morris, B. 1999). These courses may be better suited to a T-course format where there is occasional meetings and visual interaction with the instructor.

One study conducted in the field of accounting suggests that Internet delivery is not the best method for course delivery. Data from a survey of 94 chairmen and chairwomen in accounting indicates that accounting courses are not suited for this form of delivery. Of those sampled, only thirty-six percent (36%) said accounting courses should be online. In regards to

an entire accounting degree obtained through the Internet, ninety-four percent (94%) were opposed to the idea (Saunders & Weible, 1999b).

Other college departments have expressed concern in the ability to communicate abstract ideas and information. The experimental sciences, such as chemistry, that are more challenging have not been developed online. Moreover, there are no chemistry degree programs offered online by any institution in the United States (Rawls, 1999).

Access to Technology

Education delivered through the Internet is a means of providing education to the masses. However, the issue of the “haves” and the “have-nots” must be addressed in determining who can successfully complete these courses and degree programs (Doucette et al., 1999; Kautzman, 1998; Merisotis & Phipps, 1999). Computer ownership is an important issue that drives Internet education. This must be considered as a factor in online course completion. Some campuses report that ownership may be as low as ten to twenty percent (10%-20%) with students utilizing open-access-student computer labs (Wright & Yates, 1999). This is not a solution to the concept of time and place constraints and can impact the student’s ability to complete the course. There is also the question of the degree of technology. Having the equipment does not always ensure the technology is in place. Kautzman (1998) reports that Whites were almost six times more likely than other ethnic groups to have utilized the Web. Minorities are said to have less access to computers and the associated technology, which biases their ability to complete E-courses.

Higher education institutions incorporating distance education programs in their course offerings stress the importance of student access to the technology (Distance Education in Higher Education Institutions, 1998). E-courses are highly technologically dependent and the equipment used in this form of distance education can be a critical factor in student completion

rates (Hassenplug & Harnish, 1998). Low income, minority and under represented students may not have access to updated delivery technology, which could have a negative impact on E-course completion (Parrott, 1995; Romiszowski, 1993). Some students may have the computer access, but are not adequately prepared for this type of educational delivery system. In order to assure success, the student must have basic computer literacy skills and access to a minimum of technology requirements (Fender, 1999; Macht, 1998). Studies show that forty percent (40%) of the colleges and universities in the United States require computer literacy or a competency requirement (Hankin, 1999b). Access to technology and the technological experience necessary to navigate through an E-course impacts the access to the course and the learning abilities of the student (Parrot, 1995). Many students register for E-courses without having the computer skills necessary to launch the course.

Colleges and universities have created expensive programs that limit access and the student's capability to complete the E-course (Enright, 1999). Students with outdated computer systems or with computers and no access to the Internet, lack the hardware that is essential to support an E-course. Without the appropriately equipped computer (hardware and software), students may not be able to access the course or transmit their work to the instructor. Utilizing outdated technology results in a system that is slow and will often not allow for complete transmission of information, which promotes student frustration. Frustration as a negative factor in course completion is more prevalent than is currently believed (Banas & Emory, 1998). Frustration leads to a lack of motivation and causes many students to either drop or never complete the courses (Freedman, 1996; Matthews, 1999). Students who do not have access to updated technology will experience this frustration in attempting E-courses, which ultimately impacts the students' ability to complete the course.

Employment

Online education has been conceptualized as an outgrowth of the technological transformation of the workplace (Phoenix on line, 2000). Employment status may be a predictor of success in E-course completion. Evidence indicates that students who make the best use of E-courses are already working and have experience and training (Emmons, 1999; Kontos, 1995). Distance learners include students with job demands that make traditional education access unavailable (Kontos, 1995; Matthews, 1999; Miller & Jones, 1999). Demands placed on people in the workforce make it difficult to attend classes and continue the education process. Students who co-exist in the corporate sector have found that movement up the corporate ladder requires additional education that ensures overall professional growth (Greenwood, 1993; Miller & Jones 1999). E-courses are said to fit the niche in the market of distance learners, meeting the needs of working adults who desire continuing education (Hitchcock, 1999). The University of Phoenix targets the working population as students associated with their online program. They attribute their level of success to the working student who is perceived as motivated to life long learning. These students are aware of the cost of an education and realize what they must pay in terms of time and money (Farrington, 1999). The base of their student population consists of executives or business owners twenty percent (20%), middle managers in business and industry thirty percent (30%) and technical or licensed professionals forty-four percent (44%) (University of Phoenix Online Campus, 2000).

E-courses have provided employed students an opportunity to greater flexibility and fewer time constraints in meeting the demands of a college course. As a result, the student can continue working and not experience the financial hardships associated with unemployment (Fender, 1999; Larsen, 1999; Murphee, 1999). Another advantage to E-course delivery is the

ability of employed students to apply the knowledge and skills the student assimilates to their current occupation (Fender, 1999; Smith, 1999).

Statement of Problem

An evaluation of E-courses in terms of quality and effectiveness must encompass student completion rates. A high non-completion rate indicates the delivery system is not appropriate for the learner and must be assessed through the demographic make-up of the student. The demographic variables of age, gender, GPA, access to technology, student major and employment will be evaluated to determine if a relationship exists between these variables and the completion of E-courses.

This study will analyze students who have registered for E-courses through Marshall University. The study will include data obtained from the University-Computing Center and the University Registrar's Office between spring 1998 and fall 2000. The data will include all years that online courses have been offered at Marshall University and relevant data was collected. The study will also analyze three randomly selected peer universities to determine characteristics of success in E-course completion and assess the peer universities' ability to succeed with this form of learning.

Research Questions

The study is designed to answer the following research questions:

- Q1. What is the relationship, if any, between age and student completion of E-courses at Marshall University?
- Q2. What is the relationship, if any, between gender and student completion of E-courses at

Marshall University?

Q3. What is the relationship, if any, between GPA and student completion of E-courses at Marshall University?

Q4. What is the relationship, if any, between student's major and student completion of E-courses at Marshall University?

Q5. What is the relationship, if any, between access to technology and student completion of E-courses at Marshall University?

Q6. What is the relationship, if any, between student employment and student completion of E-courses at Marshall University?

Operational Definitions

Completion -The process of completing coursework with a passing grade as described by the Marshall University Student Handbook.

E-courses - A course delivered entirely via electronic means and is designated an "E-course" by the appropriate Marshall University Administrative Officer.

Age - A numerical response on the Marshall University Student Registration Form.

Gender - A response of male or female on the Marshall University Student Registration Form.

Access to Technology - A response of computer access as designated by a randomly selected survey of students at Marshall University.

GPA - A measure of the average of students grades based on a quality point scale represented by a grade of (A)-(F). (A) Representing (4) quality points and (F) representing (0) quality points.

Student Major - A response of a student's major area of emphasis as designated on the Marshall University Student Registration Form.

Employment - A response of full time or part time employed as designated by a randomly selected survey of students at Marshall University.

Significance of Study

Distance education has evolved into a new era of technology that has transformed the educational environment. The web continues to grow as an alternative and accessible means of course delivery as more and more colleges and universities implement this delivery system. For colleges and universities that are concerned with the cost and convenience of an academic program, enrollment in E-courses should be a significant issue (Chang, 1998). The stakeholders that must take issue include deans, enrollment management specialists and other higher education administrators. Distance education requires higher education institutions to implement the administrative functions of planning, organizing, staffing, directing coordinating, reporting and budgeting (Gulick & Urwick , 1937).

Higher education administrators must view distance education (E-courses) as an integral entity of the learning environment and incorporate the technology and framework in the mission, policies and culture of the institution (Banas & Emory, 1998; Chang, 1998). In order to ensure success in meeting the goals of the institution it is important to evaluate the institution's current mission, develop an evaluative cross disciplinary team, instigate a program structure and implement continuous improvement techniques (Nixon & Leftwich, 1998). This requires monitoring and addressing problems associated with student completion rates in traditional and non-traditional modes of course delivery. E-courses require institutions to address issues of allocation of resources, rules, reporting, regulatory procedures and accountability to accrediting agencies (Banas & Emory, 1998; Van Dusen, 1997). Questions regarding non-completion rates of traditional based and distance-learning programs impact the university in all aspects of these administrative issues. As more colleges and universities utilize E-courses as a means of

attracting new students, administrators must analyze methods to recruit and maintain student enrollment (Carr, 2000).

Legislators and policy makers have expressed an interest and concern in the capacity of informational technology represented by E-courses. If technology is the answer to access and cost problems, then the technology must be assessed in terms of student success and completion of coursework (Doucette et al., 1999). There is a need to emphasize student learning with technology rather than faculty teaching with technology (Chang, 1998).

Administrators, deans and instructors must coordinate efforts to assure success in the completion of E-courses. The administrative role should provide coordination and support to assure the program is meeting the same qualifications as specified in the traditional course. It is essential that each individual college supports the program and provides the leadership and governance to allow for success. There should be support financially and administratively to ensure success of the E-course program (Nixon & Leftwich, 1998).

Faculty should share in the concerns regarding Internet based courses and student completion rates. It is important that participating faculty be committed to the success and survival of the program (Nixon & Leftwich, 1998). The E-course instructor plays an important role that is significantly different than that of the traditional faculty member (Succeeding with Online courses, 1999). The teaching style used with online courses may be different from the traditional college model (Banas & Emory, 1998). Faculty should tailor their E-course teaching styles to be more collaborative and interactive. Furthermore, faculty need time to devote to the “E-students” as well as their traditional students. Faculty scheduling and workloads should reflect the administrative role of the E-course so that they can adequately track students who have not started the course or need additional help. These courses should be less student-directed

and should provide incentives to assure students can successfully complete the course work. In addition to the faculty, the dean from each college should be involved in the development and transmission of E-courses (Nixon & Leftwich, 1998). To provide a supportive environment that stimulates and motivates the student requires faculty that can adequately reflect the administrative and management role of the E-course (Nixon & Leftwich, 1998; Greengard, 1999). Faculty should be aware of students who are enrolled in the E-course and adequately track students who have not started the course or are in need of additional help to ensure completion of the course (Nixon & Leftwich, 1998).

Considering the factors addressed, there should be a form of curriculum quality control to ensure there is a proper level of teaching and learning activities to meet the North Central Association of Colleges and Schools Accreditation and other accreditation standards (Banas & Emory, 1998; Fender, 1999). Marshall University's electronic campus is a system of courses and programs that meet the "Principles of Good Practice" adapted by the Southern Regional Campus Board. It is these standards of quality that differentiate E-courses from other distance learning programs (Graves, 1997).

Limitations and Assumptions

The basis of this study is to indicate a relationship that exists between the constructs of age, gender, employment, major and GPA relative to completion of E-courses. Completion of the courses can be measured with a grade of passing designated as "D" or better on a grade scale ranging from A, (designated as the best possible performance) to a "F" (designated as the worst possible performance, indicating lack or completion of the course). Data will be obtained from Marshall University a medium sized university located in Huntington, WV. The data will incorporate the years 1998-2000. Though the sample size appears adequate relative to the

population, there are questions of generalization and external validity that must be addressed (Campbell & Stanley, 1963). The sample is representative of Universities and colleges of the size and rating of Marshall University. West Virginia is located in the Appalachian region of the country and is characterized by a unique type of culture. Given the foregoing, the sample size may not adequately reflect the population as a whole (Toth & Leary, 1991).

The purpose of this study is to establish a relationship between the independent variables and E-course completion. The study population represents student records received from the Marshall University Institutional Research Board in response to a request for E-course data. The data may be representative of E-courses and T-courses, which should be regarded as a limitation when assessing the results of this study. Also, it should be noted that the results of this study are not intended to be generalized to other colleges and universities. However, it is suggested that other institutions of higher learning conduct similar research to see if they obtain comparable findings.

Summary

Distance education is a viable alternative in providing education to students with limited access to an institutional campus. Distance learning regardless of the method has been problematic in regards to completion rates. E-courses represent one aspect of distance education that utilizes modern technology and computer applications to reach a wider audience (Willis, 1992). The Internet represents a ubiquitous electronic method of course delivery that has revolutionized education (Leonard, 1999).

Electronic courses represent an exciting and constantly evolving method of delivery but do not appear to be anymore effective in terms of student completion as compared to other distance media (Matthews, 1999). Technology and the need for improved access have provided

a flux of online courses and E-degrees. These advances in technology not only stimulate enrollment, but they generate student revenues that guarantee the institutions continued existence.

The future of higher education depends on the institution's ability to change with the evolving technology. These institutions must be aware of the problems that exist and address the issues that can lead to non-completion. If completion can be attributed to the foregoing variables than higher education administration should utilize this information to ensure improved access in higher education through E-courses.

This study addresses the concerns and questions of Marshall University, a West Virginia Public Institution actively involved in the transmission of Web-based courses. Marshall University has an obligation to investigate the problems associated with the education process and the methods utilized in course delivery. Problems associated with E-courses should be analyzed and possible solutions should be developed to alleviate the student drop out rate. Marshall has come a long way in implementing an E-course program, but there is room for growth and improvement. They must be open to new techniques and technology in course delivery in order to succeed in the area of distance learning, particularly with E-courses. It is necessary to determine the courses that should be offered and to incorporate methods to improve the delivery. Better methods to monitor student progress, communicate information and motivate students to complete these courses needs to be developed (Nixon & Leftwich, 1998).

To compete in this age of technology, Marshall must be able to make the successful transformation from a traditional on-campus program to one that is accessible by everyone. Addressing this problem can decrease the non-completion rate and provide for a better virtual classroom of learning.

CHAPTER II

Review of the Literature

Introduction to Distance Education

Web-based courses have become a paradigm in the age of digital and electronically transmitted education. Higher education is a service industry that is placing emphasis on meeting the needs and expectations of its customers, the students (Bates, 1999; Long, Tricker, Rangecroft & Gilroy, 1999). The concept of distance learning is not new to higher education and has been in existence since the advent of the written language (Charp, 1998; Phillips, 2000, Vir, 1999). Distance education has been perceived as a viable means of providing education to geographically and time challenged students (Barone & Luker, 1999; Becker, 1999; Dunn, 2000; Fender, 1999; Greengard, 1999; Higgins & Bouvier, 1999; Inman & Kerwin 1999; Kirkeby, 1999; McQueen & Wright, 1999; Willis, 1992). The premise of this form of education was to extend the traditional institution and overcome the problems of scarcity and exclusiveness.

The vital component in distance education is the method and mode of communication. To be effective this communication requires a sender, a message and a receiver (Barone & Luker, 1999; Nasseh, 2000). According to the Cartesian theory, a person can effectively learn independently if there is a teaching instrument that is a source of knowledge perceived to be the message (Purdy, 1986). This source of knowledge can be transmitted in many forms including the written book, a television screen or a computer terminal. The effectiveness of the teaching instrument and the ability to communicate is key to any successful distance education program (Banas & Emory, 1999).

Computer technology provides a medium for the transfer of information from sender to receiver. On-line courses commonly referred to as E-courses, provide several advantages in providing education to students through a unique mode of transmission. This transmission is powered through technology and serves as the integral component in the learning process and the transfer of knowledge. Technology serves as the means of transfer, converting signals over a telephone line with microcomputers and a modem providing the link between educators and students (Brennan, 1992). The technology used in distance education can be a critical factor in the quality of communications and information exchange (Hassenplug & Harnish, 1998). Distance education via the computer has been viewed as an evolution in the education process with the Internet and E-courses viewed as a quality medium for providing distance education. Internet programs have been designed to meet the needs of the non-traditional student who cannot fit into the standard residential program. This has required higher education institutions to develop and integrate E-courses and entire On-line degree programs (Chang, 1998; Grossman, 1999; Long et al, 1999).

The basis of this study is to analyze and interpret data that can provide a meaningful contribution to distance learning. Technology continues to lead the way to advancements in the education process and should be evaluated in light of the evolution of the Internet and E-courses.

To fully understand the issues associated with E-courses a review of the history of distance education and the history of the Internet are explored.

History of Distance Education

The concept of distance learning incorporates the process of lifelong learning administered through schools and educators who are physically separated from the student (Kim & Hairston, 1998; Freedman, 1999). Distance learning can be identified by several characteristics. These characteristics include separation of the instructor and the student, the influence of the organization on the content and the delivery of the course, the use of some form of technical media, a two way system of communications, and independent work by the student (Spooner, Jordon, Algozzine, Spooner, 1999). Serving students over wide geographical areas is the main thrust of distance learning (Seehusen, 2000). Section 486 of Title IV of the Higher Education Amendments of 1998 authorized the Distance Education Program to increase student access to higher education and to determine the best way to deliver quality education through distance learning. According to the National Center for Education, distance education is growing at an annual rate of thirty three percent (33%). It is predicted that by the year 2002, eighty eight percent (88 %) of all universities will offer some form of distance learning (Lamb, 2000).

Though distance education has been perceived as a fairly new concept, the earliest method of communicating ideas was the extension of the written word (Ballon, 1999; Matthews, 1999). The first generation of distance learning was correspondence through letters, notes and books. Writings and books were conceptualized as one type of distance education, providing a written message from a sender to a receiver. These books provided a medium where experts in the field could write down ideas and transport them over time and space to remote students over the world (Romiszowski, 1993).

Some of the first examples of distance education can be traced to correspondence courses dating back to the 18th century. In 1840 Isaac Pittman, the inventor of shorthand, began teaching shorthand courses through mail correspondence in Great Britain. Pittman's idea was widely accepted worldwide, with early correspondence courses traced back to this European influence (Matthews, 1999). In 1836, The University of London began offering distance degrees (Fender, 1999). British citizens located abroad were permitted to study textbooks and materials on their own and demonstrate their competency through written examination (Phillips, 2000). In 1856, Charles Toussaint and Gustav Langenscheidt instigated distance education in Germany by teaching Languages through correspondence (Baker, 2000). In 1858 The University of London expanded course offerings to include the External Programme, which promoted access to higher education to remote European students.

In the United States distance education was also being used successfully to educate remote students. In 1873, Anna Ticknor created the Society to Encourage Home Studies. The basis of the society was to provide educational opportunities for women. Ticknor's program provided distance education to approximately 10,000 students (mostly women) over a 24-year period (Nasseh, 2000; Phillips, 2000).

In 1883 a Correspondence University was headquartered at Cornell University but never really established notoriety due to issues of quality and effectiveness (Baker, 2000; Matthews, 1999; Nasseh, 2000). Regardless of the move for providing distance education, there was much discussion at this time to the effectiveness of this correspondence education relative to traditional study. Nonetheless, the concept of distance education continued to grow and gain acceptance as a valid source of education. The first official recognition of education by correspondence in higher education came in 1883 at Chautauqua College of Liberal Arts. The college was

authorized through the state of New York to provide Correspondence academic degree programs. These programs required completing course work at summer institutes and correspondence work during the academic year. Also in 1883, William Rainey Harper at Yale University was authorized to grant degrees to students who completed correspondence work. He believed that correspondence study could not fill a void in education by supplementing oral instruction or serving as a substitute for the classroom. Nonetheless, Harper continued to support this form of learning and was instrumental in developing the University of Chicago's mail correspondence courses (Nasseh, 2000; Phillips, 2000). There was a drive to provide this level of learning to the remote student promoting higher education to a greater audience. Vincent (1885), an educator in this era was quoted as saying:

“The day is coming when the work done by correspondence will be greater in amount than that done in the classrooms of our academics and colleges; when the students who shall recite by correspondence will far outnumber those who make oral recitations.” (Watkins & Wright, 1991).

The movement for the development of university-level extension continued during this time period and was strengthened by the works of Herbert Baxter Adams. His enthusiasm for distance learning was extended to his students at Johns Hopkins University who would carry on his values and beliefs for the future of distance learning.

By 1890 the vision for distance learning had continued to grow with other institutions of learning accepting this as a valid and acceptable means of providing education to remote students. The Colliery Engineer School of Mines in Wilkes-Barre, Pennsylvania found merit in this form of learning and established a home study course in mining under the leadership of

Thomas J. Foster. In 1891 the school expanded its outreach and later became known as The International Correspondence Schools (ICS).

The popularity of distance education and this form of learning continued to grow and in 1892 Penn State became one of the first universities to develop a complete correspondence program, which emphasized a program in agricultural studies. The program incorporated the concept of Rural Free Delivery, the 19th century version of the information highway (Banas & Emory 1998). Within two years the program had four graduates. Two of the degrees were granted to students located in Pennsylvania and the other two degrees were granted to far more remote students, one in Canada and one in Oklahoma. The university epitomized the true meaning of distance learning by providing this level and quality of distance education to remote students nationwide. Today the university continues its outreach of distance learning and serves more than 15,000 students in every state and in 50 countries. Technology-based distance education is best linked to the introduction of audiovisual devices into the schools in the early 1900s. Instructional films were developed and utilized in the educational process (Reiser, 1987) In 1913 Thomas Edison stated that, due to the invention of film, "Our school system will be completely changed in the next ten years" (Saettler, 1968, p. 68). This revolutionary change did not occur, but by 1920, instructional media were introduced into many distance programs in the form of slides and motion pictures (Wright & Yates, 1999).

The 20th Century brought about new enthusiasm and commitment in providing education to students whom could not physically attend a college campus. Though the concept would continue to grow in popularity and acceptance, the effectiveness and validity issues would remain a concern to academia. In 1915, the National University Extension Association (NUEA)

was created to focus on issues related to correspondence study including evaluating the standards of quality and policies regarding course credit.

The second generation of distance learning evolved between 1920 and 1970, as education delivered via broadcasting medium. As radio and television developed, it was thought that the advancements in this form of technology would drive the source of the educational medium and that the focus on the use of radio and television would increase the popularity, acceptance and effectiveness of distance learning. Between 1918 and 1946, the federal government granted radio-broadcast licenses to 202 colleges, universities and school boards in order to promote distance learning through the radio waves. In 1922 Penn State began broadcasting courses over the radio and by 1925, the State University of Iowa offered five courses for college credit. Major industries including packing companies, the railroad, the banking industry and the military saw merit in this mode of delivery and supported the methods and developments associated with this form of education. Wartime extension programs also looked to correspondence courses as a means of providing technical and mechanical training opportunities to a mass of learners. Regardless of the level of support for broadcasting medium, the radio, as a method of course delivery did not gain notable recognition and failed to attract large student enrollments. These courses failed to generate the required level of student interest to continue this mode of delivery.

By 1940 only one college correspondence course was being offered through the radio waves. Today several universities continue to utilize radio broadcasting as a source of distributed learning. The University of Wisconsin, University of Central Florida and Perdue University are examples of institutions that continue to utilize radio signals as a means of course delivery (Gooch, 2000; The UCF Virtual Campus, 2000).

The introduction of television as an instructional medium appears to be an important entry point in the development of correspondence education. Consistent with advancements in technology, a push for television was considered as another acceptable medium for course delivery. In 1934 the State University of Iowa began to use television to deliver courses in oral hygiene and astrology. The need to provide education to the remote student and the increase in the non-traditional student population as a result of the GI Bill required a rigorous move to provide education through external modes of delivery with technology as the driving force. The 1950's and 1960's were characterized by a launch of local educational television stations that would provide college courses, refresher courses and technical training to meet the needs of the growing population.

Issues regarding learners' characteristics, student needs, effective modes of communication and the value of the outcomes were continuously questioned in terms of distance learning and the various methods used to provide distance education. At this time little research had been conducted to validate the methodology and the integrity of these programs. In 1950, The Ford Foundation played a substantial role in studying the application of television in course delivery and offered grants to develop televised educational programs. Research conducted by Gale Childs (1956) showed that there was very little difference in televised courses and the traditional classroom. Studies by Parsons (1957) and Lapore and Wilson (1958) offered research showing that learning by television compared favorably with conventional instruction. The Ford Foundation stated that radio and television were merely the instruments that brought instruction to the remote student and could not be viewed as the actual means of learning. This concept would continue to be a focal point in analyzing future instruments of correspondence course

delivery and serve as a critical point in assessing student learning and the acquisition of knowledge.

A significant development in providing distance education through a mixed media approach was developed in 1969 at the British Open University. The pretense of the Open University was to provide non-traditional students, who were unable to attend a physical campus, the opportunity to a higher education, regardless of the location. The Open University was based on the concept of team design, building its reputation on high-quality course materials. The success of the Open University proved the viability of distance education and the concept of adults working independently, providing new insights and opportunities in distance learning. The process incorporated several modes of delivery and was viewed as distance education on a massive scale (Jamlan, 1995). The development of these open universities would be instrumental in improving the perception and acceptance of distance education programs by the public. They were also perceived as a more economic means of providing education to the remote student by eliminating the concept of scarcity, and allowing a larger number of students the opportunity to an education. New York State Empire State College was the first Open University established in the United States (1971). Charles Wedemeyer of the University of Wisconsin and Gayle Childs of the University of Nebraska were instrumental in establishing this level and degree of distance education in the United States.

Advancements in distance education continued over the next two decades spawning the third generation of distance learning. This generation is characterized by technologies that include tele-courses, satellite delivery and videocassette recorders (VCRs) that were used to tape the courses for delayed viewing. The University of Arizona established a video campus that utilized VCR technology to transmit information to the student. Newer technologies in distance

education continue to incorporate televised learning that includes two-way interactive television (ITV). This method of delivery allows interaction between the student and the instructor through real time delivery at a remote site (Clow, 1999). The format has been viewed as approximating the classroom experience since the student and instructor are interacting in real time. Though viewed as a better means of communication between the sender and the receiver, it still defies the true meaning of distance learning by requiring the student to attend a remote site at a specified time.

Progress in the education process over the last two hundred years has been instrumental in providing students an outlet to higher education without the burden of attending the physical campus. Revolutions in computer technology and the development of the internet have played a major role in providing distance learners with the opportunity to an education within the definition of distance education; at the student's own time and place. Computer technology continues to drive education and the methods utilized in the learning process.

The fourth generation of distance education is based on this higher form of technology including the use of telecommunications and computers. It is the development of this technology and its use in the education process that is questioned in relation to quality, effectiveness and acceptance (Banas & Emory, 1998). Distance education utilizing computer technology is one way of meeting the needs of today's society that fosters the mentality of life-long learning. A flexible system of providing education through the Internet allows all learners the opportunity to an education and an increased level of knowledge. Information technology allows developments in higher education that transform how, where and what can be taught. The ability to reach all learners and provide an adequate means of commuting knowledge has been debated over time. In his 1869 inaugural address, William Elliot the president of Harvard

University (1869-1910) stated, “It’s not what to teach, but how to teach ”(Goodchild and Wechsler, 1997,p.388). Technology, telecommunications and the use of the Internet have been viewed as an important construct in the “how’ of teaching.

History of the Internet

Technology continues to be the driving force in distance education providing a medium of communication for the transfer of thoughts and ideas. The Internet has been developed to serve as a medium in providing distance education courses to remote students. It has been stated that the Internet is one of the “Greatest Gifts higher education has given the world.”(Spanier, 2000). The Internet has contributed to distance learning by overcoming the barriers of space and time in the education process (Eric Digest). It is described as a network of networks, providing an exchange of information through computer technology.

Section 410A of Title IV of the Higher Education Amendments of 1998 established the Learning Anytime Anywhere Partnership Program to enhance the quality, delivery and accountability of higher education through programs and models that emphasize the use of technology. The emphasis is on learning independent of time and place requirements and focusing on lifelong learning opportunities.

The Internet was originally developed in response to the USSR launching of Sputnik in 1957. The United States government formed the Advanced Research Projects Agency (ARPA) as a division of the Department of the Defense (DOD). The main intent was to provide a scientific and technology based medium to serve the military and military research contractors (Charp, 1999; Spainer, 2000). Paul Rand of the RAND Corporation worked through the Air Force to develop a system that allowed for control of missiles and bombers in the instance of a

Nuclear Attack. His proposal was a computer network that would breakdown and store data to be forwarded throughout the network system. The system was termed the ARPANET, a cooperative network of time- sharing computers (Kristual, 1997; Phillips, 2000; Spainer, 2000). In 1968, a physical network of four institutions including the University of California at Los Angeles, Stanford Research Institute (SRI), The University of California at Santa Barbara and the University of Utah, was developed utilizing 50 Kbps circuits. In 1974, a commercial version of ARPNET was developed and released under the name Telnet. The system continued to develop and by 1989 there were more than 100,000 BITNET hosts located worldwide. In 1990, ARPNET, as first developed, ceased to exist and was replaced by the NSFNET backbone comprised of search tools such as Archie, GOPHER and the World Wide Web. At this time congress initiated some control over the Internet through the development of the National Research and Education Network (NREN) and through passage of the US High Performance Computing Act (History of the Internet, 2000, Kristula, 1997).

In 1992, the World Wide Web was officially released to the public through the Corporation for Research and Educational Networking. The Internet continues to grow and has become the primary source of business communications with approximately 3 billion e-mail messages sent per day surpassing the telephone as the chief means of communication (Hankin, 1999; Phillips, 2000; Spainer, 2000). The Internet is growing annually at a rate of greater than one hundred percent (100%) and it is predicted that by the year 2006, there will be over 900 million computers and other web based appliances in use (Charp, 2000). The Internet is epitomized by the ability to provide news and information to a growing population of computer users (Bucy, 2000). Banking, Investing and shopping on the Internet have become standard practice with education tapping in on the market (Luis, 2000; Hiebert, 1999; Wahl, 1999).

Computer based education has spawned as the “Virtual Classroom, “ allowing student the opportunity to learn at their own time and place. The Internet is being used more frequently in higher education for the transmission of information, class materials or an entire class.

“Anybody with a laptop and access to a telephone line can be taken in and learn at is or her own speed, without slowing up others.”(Von Hoffman, 1998).

E-courses are defined as electronic courses that are delivered entirely via electronic means and are designated as E-courses by the appropriate administrative officer. Students enrolled in an E-course are not required to come to a classroom for any part of the course (Marshall University Policy Bulletin 13, 1999). This classroom is maintained through computer groupware or is operated over the Internet as digital collaboration environments or information portals (Mottl, 2000). Communication capabilities include E-mail, bulletin boards/news groups, downloading of course materials or tutorials, interactive tutorials on the web, real time interactive conferencing systems or Internet Relay chat, simultaneous interaction with chat groups, audio conferencing and video conferencing from a computer, intranets and informatics that provide the use of online databases, library catalogs and research websites. The system allows for instant communication and feedback which is vital to distance learning (Armand, 2000; Linial, 1998; MacDonald & Caverly, 2000; Morris, B. 1999; Schantz, 1999).

Corporations have utilized computer technology to develop training programs and or university systems to provide training opportunities to their employees. Motorola and Disney are two examples of such companies that have developed Internet-based classroom instruction to communicate vital information and learning tools to their employees (Charp, 1999). Other players have entered the field developing educational programs dedicated to providing distance

education through cyberspace. This includes Corporations, government offices and institutions of higher learning.

Academic Institutions have been instrumental in developing and utilizing this method of course delivery. These institutions target workers who need retraining or advanced degrees but cannot be confined to the physical classroom. The “virtual university” has been described as a web of educators that provides college courses to students at the time, place and pace as desired by the student (Dunn, 2000). The Western Governors University, the University of Phoenix and Jones’s International University are examples of ventures that have been successful in providing students with online access to higher education (Barone & Luker 1999; Katz-Stone, 2000; Macht, 1998; Morris, K. 1999).

The Internet continues to grow and serve as an important source of delivery in higher education. Internet based education is aimed at serving remote students, part-time students, time constrained adult learners and employed learners (Banas & Emory, 1999; Fender, 1999; Matthews, 1999). The types of programs offered through the Internet and the varied student populations that are served through this method of course delivery has allowed for continued growth and interest in computer based education.

As of 1999 the demand for lifelong learning is over 165 million people, whose educational needs cannot be met by a traditional education (Barone & Luker, 1999). “The question is not, how can we transport the classroom? But rather, what can we do with the technologies to reform, change, and improve adult learning?” (Hopsey & Ginsburg, 1998). It is predicted that by the year 2025 the Internet and E-courses will be the predominate mode of providing higher education (Dunn, 2000).

The Internet will continue to be driving force in providing education by extending the role of the traditional University to eliminate the problems of scarcity and access, by promoting the opportunity to learn (Mathews, 1999; Murphee, 1999). Information Technology will continue to grow, providing an affordable and sophisticated means of communicating and accessing education (Barone & Luker, 1999). Education through technology can be viewed as a service model that is prepared to serve the student population when the student is ready to learn.

Regardless of the technology, there is strong evidence that on-line students have a higher rate of attrition than their traditional counterparts (Carr, 2000; Duderstadt, 1997; Fisher, 1999; Ziegler, 1999). There is a plethora of studies that indicate there is a higher level of non-completion with distance education as compared with the traditional based course. Retention of adult learners has been a problematic area in higher education programs since these students are viewed as educationally disadvantaged because of time and place constraints. Time spent in a classroom presents a burden to employed students in terms of productivity and lost wages (Banhazi, 1999). Regardless of the classification of the type of educational delivery method, completion rates remain a problem that must be analyzed and explored in depth. Many researchers have examined completion rates of distance learners, particularly the computer mediated programs, to determine rates of completion as compared to the traditional course. A study of students in computer-mediated distance learning programs provided evidence that on-line student experienced a higher attrition rate (32%), as compared to the classroom students with an attrition rate of four percent (4%) (Oakely, 1997). Additional statistical analysis has revealed that on-line non-completion rates are generally ten to thirty percent (10-30%) higher than the traditional course (Carr, 2000; Duderstadt, 1997; Merisotis & Phipps, 1999; Parrot, 1995; Smith, 2000). It is believed that there are student demographics that can be viewed as

predictors of completion rates. It is important to assess the student's background and experiences in order to gain insight to these predictors of success and failure (Easterday, 1997; Szulc, 1999). These predictors can be attributed to demographic factors that include age, gender, employment, access to technology and GPA (Zhang, 2000). In order to comprehend the impact of these student predictors in course completion rates requires some context to the advantages and disadvantages of on-line course delivery.

Advantages of E-Courses

Distance learning, regardless of the medium, is vital to the concept of lifelong learning. Lifelong learning is a concept that is vital to the concept of distance learning and Internet education (Smith, 1998). Providing college courses via electronic transmission is the move into the future of higher education. Higher education institutions view distance education programs as a means of providing education that is accessible and affordable to the student. Distance education courses were originally intended for adult students who wished to pursue a degree or seek some form of continuing education. In 1995, higher education institutions developed courses to meet the needs of continuing education students (13%). Professionals seeking some form of re-certification also were targets for distance education courses (30%). Working students who desired new skills for advancement or due to job displacement were targets for 49% of the institutions.

Institutions of higher learning are concerned with what students will learn, how they will learn and where they will learn (Davidow, 1999). Despite the negative attitudes associated with E-courses, it is a mode of delivery with which students are satisfied (Inman & Kerwin, 1999). Online courses are said to create a "community of learners", an environment where students can learn on their own, from each other, the instructor and the class as a whole (Harris, 2000).

Internet based courses have expanded the classroom, allowing remote students the opportunity to communicate and interact through cyberspace. Students are exposed to other students of diverse backgrounds, including the attributes of age, gender and culture, which can have a positive impact on the learning process (Alexander, 1999; Arbaugh, 2000; Berger, 1999; Harris, 2000).

The market for Internet based courses has increased substantially with two thirds of the accredited colleges and graduates schools offering Internet courses and over 20 AACSB-accredited business schools offering entire MBA programs online. Implications for the future indicate there will be more professional degrees obtained on line, more undergraduate class work will be conducted outside of the traditional classroom and there will be less distinction between the traditional and the on-line student (Altman & Pratt, 1999). Institutions offering distance learning also reap benefits in providing distance education. Not only will the institution experience an increase in enrollment, but it will also see a positive impact on instructional staff and a reduction in building and maintaining the campus. The institution is also viewed as technologically advanced by providing state of the art methods and mediums that provide students with more flexible access (Matthews, 1999).

Studies conducted by Arbaugh (2000) indicate that flexibility and the lack of constraints are some of the major advantages to E-courses. Students are drawn to the convenience of E-courses which provide for a level of flexibility, which allows the student to maintain a balance between education and the concept of personal development while maintaining a family and employment obligations (Baker, 1999; Hitchcock, 1999; Mason, 2000; Murphee, 1999; Young, 2000). Students view time spent learning as the cost of investment in human capital (Becker 1999). People with jobs, families and other commitments perceive on line learning as an economic and viable means of lifelong learning.

The traditional classroom is not the best mode of delivery for all people and on line courses can be a viable alternative (Fisher, 1999; Fender, 1999). Regardless of the positive inference, the effectiveness of on line courses as a form of distance learning continues to be questioned and analyzed. Few studies have measured the effectiveness of on-line courses relative to the traditional classroom. However, most research in the area indicates that on-line education can be as effective if not more effective than traditional education (Morris, 1999; Murphee, 1999; Mulligan & Geary, 1999; Charp, 1999; Behn's article; Spooner, et al 1999). A study conducted by the University of Phoenix administered standardized achievement tests to students who took Internet courses and students who took the course in the traditional means. The students who took the Internet course scored 5-10% higher than the traditional on campus student (Gubernick & Ebeling 1997; University of Phoenix Online Campus, 1999).

A compilation of 248 studies conducted to assess the outcomes of distance learning as compared to the traditional classroom, indicated there is not a significant difference in the outcomes (Farber, 1999; Fender, 1999; Fisher, 1999; Freedman, 1999; Spooner et al, 1999). Studies that compare cognitive factors associated with learning including the amount of learning, academic performance, achievement and examination and assignment grades indicates there are no measurable differences (Russell, 1996; Spooner, et al, 1999). These studies indicate on-line students may be learning more and retaining more of the course material regardless of the lack of interaction with the professor and the other classroom insights described as beneficial to the learning process (Green, 1999; Spooner et al, 1999; Sonner, 1999). Learning is a process based not only on the acquisition of fact but in the active role of learning valuable skills and methods of problem solving (Murray, 1999).

Internet based instruction provides a means of providing accessibility to degree programs and continuing education in an effective and cost efficient manner. When institutions commit to organizational change involving the Internet and online learning then E-courses can become more cost effective (Barone, & Luker, 1999; Charp, 1999; Greengard, 1998; Morris, 1999; Mulligan & Geary, 1999; Romiszowski & Iskandar, 1992;). Cost factors can also impact the importance of the Internet as a source of learning. Courses held in a conventional classroom can average \$75 an hour, with computer-based courses shown to be less costly averaging \$45 an hour (Gubernick & Ebeling, 1997; Linial, 1998; Mottl, 2000). Cost evaluations have been conducted by the University of Phoenix, which compared On-line courses with the traditional based courses. One credit hour of On-line course work was provided at a cost of \$237 compared to the traditional method at \$486. The cost differential is attributed to lower labor and benefit costs (Banas & Emory, 1998).

Internet courses are also viewed as a means of serving the masses. Students can receive instruction at their own time and pace and the class is not limited by room size and seat constraints (Jackson, 1999; Jamlan, 1998; Mason, 2000; Matthews, 1999; Mottl, 2000). The Internet is a vital force in education and the way people learn. The information age has created the need for continuing education and more advanced skills.

In order to maintain the philosophy of life long learning, technology has provided a form of college education that conforms to the traditional form of delivery without the rigid structure of the traditional campus (Daviddow, 1999). Online courses can add synergy to the learning process through the “virtual classroom” where students learn in a unique environment that minimizes the constraints of a traditional education (Alexander, 1999; Berger, 1999; Linial, 1998). Students state they have more freedom and are less inhibited in expressing ideas and

communicating thoughts (Jerome, 1999). Because of the relaxed environment, students have the time for deep thinking in terms of comments and responses when the student is required to respond (Alexander, 1999; Mulligan & Geary, 1999). Students may also be able to communicate more freely because visual barriers, which can impact communications, do not hinder them.

Web based courses continue to grow in all subject areas allowing students the opportunity to learn and continue their education. Web based courses can be viewed as the perpetuation of the educational process in a unique and structural environment. With Internet based courses the pace is determined by the student since students have the ability to access the course materials at any time of the day or night from computers on campus or from a remote location. This type of offering is an effort to attract students who desire an alternative to the traditional classroom setting.

The quality of Internet based courses can be assessed through the observation of several factors. Previous studies indicate that cognitive factors (amount of learning, performance, achievement, examinations and the assignment of a grade) are areas of assessment and are rated basically the same for E-courses as for traditional courses (Spooner et al, 1999)

Disadvantages of E-courses

Many of the same problems facing implementation and acceptance of E-Courses today have been faced by distance education throughout its history. Studies regarding Internet based courses are not without some level of skepticism and doubt. E-courses are perceived as a basic correspondence course with a more technological platform for course delivery. Research conducted by Saunders and Weible (1999a) surveyed 305 accounting chairpersons and deans of business schools as to their perception of E-courses. Of the 305 respondents, 65% stated they believe E-courses to be a correspondence course with a different delivery medium. It is the

technology and the mode of delivery that has raised some level of controversy. The delivery medium described as the Internet is questioned in terms of effective and efficient education.

One area of concern centers on the interaction and socialization, or the lack thereof, in an Internet based program. As with any correspondence course there is some question to student interaction and socialization, which is deemed as an important aspect of the college experience. Higher education is viewed as playing an important role in the socialization of students. This is regarded as an important aspect of the total educational process and is necessary for a “well-rounded” experience (Fender, 1999; Fisher, 1999; Tinto, 1987). The surveyed professors in the Saunders & Weible study indicted that the campus experience gives the student a component of their education that is not generated through an E-course. The coursework completed by the on-line student is considered less valuable without the necessary interaction between the student and the instructor and the student and their peers (Saunders & Weible, 1999b). The social contact is an important component in the learning process and is essential for course and degree completion. Communications between students and faculty is recognized as an integral component to the education process (Farber 1998; Fender, 1999). E-Courses cannot supply the spontaneity and the person-to-person interaction experienced in the classroom, leaving distance learners feeling isolated and alone (Long et al, 1999). The Internet should serve as a source of education and a means of communication but it should not promote an environment of isolation. To quote Supreme Court Justice Ruth Bader Ginsburg in her discussion on Concord University Law School (a totally online Law School) “I am troubled by ventures like Concord where a student can get a J.D. without ever laying eyes on a fellow student or professor.” (Peek, 2000).

There are other factors that must be considered when evaluating E-courses, including student satisfaction with the course, comfort level, convenience, communication with the

instructor, independence and the perception of effectiveness. These factors prove to be inconsistent when compared with the traditional on-campus education. Teaching and learning occurs in a context that is different for E-courses and traditional courses. The premise for E-courses is based on a technology foundation that supports this delivery system. It is this context of the Internet based environment that must be analyzed and evaluated to determine if the technology is optimal for this type of learning (Barly, 1999; Farber, 1998).

The concept of independent learning is an evaluative factor that is emphasized when determining the net worth of E-courses. Students find the factor of working independently as favorable but find student/instructor communication or the opportunity for communication as a negative factor in distance learning (Cooper, 2000; Spooner et al, 1999). E-courses have been shown to compromise the interaction and communications that are key components of the learning experience (Neumann, 1998). Distance education limits the ability of students to collaborate with their peers on the subject matter and engage in exploratory discussions. “There is value in being at a university campus, interacting socially and intellectually with fellow students and teachers.”(Plant, 1996). Studies conducted by Spooner et al (1999), support the need for interaction. They reported that when students were given a choice they preferred the personal contact associated with a traditional classroom regardless of the positive characteristics associated with E-courses (Spooner et al, 1999).

It has been asserted that distance- learning utilizing the Internet is cheaper, faster and more efficient than other modes of delivery; however, there is still some question to the effectiveness (Enright, 1999; Farber, 1998; Hassenplug & Harnish, 1998; Jackson; 1999; Mottl, 2000). This question of effectiveness is directly related to the level of interaction between and among the participants, including the students and the instructor. The definition of distance

learning promotes the issue of a lack of contact and face-to-face interactions that are typical of the traditional classroom. Access to data does not promote student learning or expand the knowledge base or initiate a framework of ideas. To facilitate the learning process requires removing the barriers associated with the electronic classroom. Rohfeld and Hiemstra (1995) developed a set of concepts that overcome the challenges associated with this mode of delivery.

1. The instructor must establish the tone of the course early in the class.
2. The text-based nature of the class must be overcome by establishing group rapport and cohesion.
3. Provide training and guidelines that allow learners to develop technical competence.
4. Provide stimulating techniques that include debates, polling, reflection and critique.
5. Provide learning contracts to establish participation.

Interaction or the lack thereof with Internet based courses has also been shown to impact student outcomes. Studies conducted by Arbarugh (2000) show that online students performed lower than the traditional students because of the low level of class participation and lack of student and faculty interaction. These students become more frustrated because of the inability to ask the instructor questions in a face-to-face environment (Emmons, 1999). Institutions must be conscious of the methods utilized in transferring and sharing information and the effectiveness of the technology. Studies conducted by Behm (1990) found that younger students valued interaction more highly than adult learners. In addition, research conducted by Hezel and Dirr (1990) indicates those students in distance programs value interaction with their professor moreover than their interaction with other students. Additional studies evaluating the factor of

interaction have demonstrated that increased interaction in any form of distance learning can contribute to higher completion rates (Hazari, & Schnorr, 1999; Vir, 1999). Emilio Ramos, Dean of Academic and Administrative Technology at the Lecroy Center realized a course completion rate increase of approximately 30%, when he switched to a more interactive Internet program that provided more interaction with the students (Carr, 2000).

E-courses are noted for their ability to provide education to the non-traditional student looking for an alternative to the traditional setting. However, the impact of web-based learning is said to complement or supplement the traditional campus with the core teaching and learning experiences remaining on the physical campus (Harris, 2000; Saunders & Weible, 1999b; Young, 2000). It is believed that student-teacher interaction is imperative for learning to occur (Carr, 2000; Iman & Kerwin, 1999). The interaction acquired through an Internet based course tends to be less efficient because of the difficulty in the information exchange and the difficulty in developing social ties (Hightower & Sayeed, 1995; Warkentin, Sayeed & Hightower, 1997). These factors along with the short time factor associated with these courses can be a contributing factor to the high levels of attrition associated with Internet based courses (Ellram & Easton, 1999). It is important that the medium of communication be the proper fit to the appropriate learning model in order to enhance the necessary level of interaction (Arbaugh, 2000; Cooper, 2000).

The level of interaction and the role that the student and the instructor must realize in this form of education is imperative to the completion of the course. The teaching paradigm must shift from a teacher-centered model to a student –centered model, which requires the proper training of professors and students to adapt to the technology (Armand, 2000; Willis, 1992). Web based courses are regarded as Lerner-centric verses Teacher-centric modes of instruction.

Learner centric theories focus on the importance of the learner. Knowledge is transferred to the learner with the instructor serving as a coach or facilitator. The learner takes on a more active role and the instructor as the passive participant (Barone & Luker, 1999; Inman & Kerwin; 1999; Murphree, 1999). Internet education requires a different set of skills and responsibilities. This presents a challenge to students who state that lack of direct contact with the instructor and lack of immediate feedback lead to discouragement and loss of interest (Banas & Emory, 1998; Berger, 1999; Carr, 2000; Neumann, 1998; Young, 2000).

The successful online courses have been evidenced with low student to faculty ratios with higher levels of interaction. This is an indication of the need for student-professor interaction that is present in the physical classroom, while maintaining the emphasis of the learner-centric theories of instruction (Carnevale, 1999; Greengard, 1998; Mulligan & Geary, 1999; Sherry, 1998; Young, 2000). The University of Phoenix has a student to faculty ratio of approximately 8:1, which may account for their higher levels of completion. (Teaching at an Internet distance, 1999; Young, 2000). Smaller classes are indicative of the level of interaction that is necessary for high quality education. A well designed E-course program should include the following components:

1. Provisions for any special requirements the student might have
2. Adequate time to complete all courses
3. An ability to compensate for the lack of face-to-face experience
4. One on one attention (Larsen 1999).

Seven On-line students, interviewed by the Chronicle of Education, stated that though the courses are regarded as convenient, they are not comfortable or easy. They stated that this mode of delivery requires more time and reading than was anticipated (Cooper, 2000; Young, 2000). The students felt a continuous obligation to log on to the course since they had twenty-four hour a day access. The students that were interviewed emphasized the drawbacks to this form of education but contended that the flexibility was a stronger and more contributing factor (Banas & Emory, 1998; Iman & Kerwin, 1999; Johnson & Silvernail, 1994).

In addition to the aforementioned concerns of interaction, it has been suggested that E-courses do not promote the traditional experiences of the physical campus. The physical campus promotes an academic environment as well as a social environment (Farber, 1999; Tweney, 1999; Walston, 1999). This includes personal development, long-term learning, socializing with other students and the formal and informal contact with the faculty (Davidow, 1999). E-course students cannot form the bonds with professors that the traditional student can experience. A virtual university cannot duplicate the experiences and opportunities afforded through an education delivered through a physical campus. The efficient acquisition of knowledge is only one aspect of the college experience. Socialization with faculty, staff and peers as well as living away from home can contribute to the total college experience that cannot be obtained on-line (Tweney, 1999).

As with any technological endeavor there is a certain level of cost associated with producing and delivering a quality product. This raises another point of controversy over the costs associated with instigating and maintaining an E-course. Hardware and software requirements to carry an E-course can be expensive and not financially available to all students (McDonald & Caverly, 2000; Mulligan & Geary, 1999; Neumann, 1998; Parrott, 1995). An E-

course requires the student to have a modem and an Internet Server Provider (ISP). E-courses must also be supported by a minimum modem speed and bandwidth. Some courses require sound cards, speakers and digital cameras, video capture cards and specialized software. Issues of the digital divide and the question of social access to the Internet have been raised in reference to Web based education. Although the number of Internet users continues to grow there are minorities, single parent households and the low-income population who are not computer literate and do not have technological access (Bucy, 2000; Doucette, Ferren & Mingle, 1999). Students in this category are usually seeking access to Internet courses because of time and family constraints. These students will register for the course and fail to complete the course because of limited access.

Procrastination is the most common time management problem that students experience. This has been cited as a major reason for non-completion of E-courses. Students are exposed to an unstructured learning environment that requires dedication and time management strategies to ensure success (Banas & Emory, 1998; Miller & Jones, 1999). With the freedom and flexibility associated with E-courses, students must be committed and disciplined to the learning process. A task force study conducted at the Virginia Community College polled students who registered for distance education courses and failed to initiate the course. The students stated they felt online courses provided a solution to attending college when they were too busy to attend a physical campus, but they (the students), lacked the self-discipline necessary for an independent learning environment (Easterday, 1997). Those students who immediately start the course and do not procrastinate tend to be the ones who complete the course, usually in the semester of enrollment (Nixon & Leftwich, 1999). This observation has led many institutions to require course completion in the semester of registration, eliminating some degree of procrastination.

There are attributes of success that a student must possess to experience success with an online course (Fender, 1999). Students must have the ability to function independently and feel comfortable in a computer-based environment (Murphee, 1999). Those students who fail to complete on-line courses cannot adapt to working on line or are under the impression that the online course is less difficult than the traditional classroom (Morris, B, 1999).

Students also view courses on the Internet as a novelty or a new experience that can be a basis for the student opting for this mode of delivery. This novelty or new experience is usually short lived and can contribute to the non-completion associated with Internet based courses (Arbaugh, 2000; Carnevale, 2000; Gibson & Gibson, 1995). Students anticipate a certain expectation and quality of the Internet course that meets or exceeds their expectation of the traditional classroom (Fungaroli, 1999; Rahm & Reed, 1997). Though new technology is exciting it is not the right environment for everyone. Students should be aware of the limitations and determine if they have the attributes for success. Even when students respond favorably to the on-line courses there can be questions of internal validity in assessment and evaluation (Easterday, 1997).

Students may also have a preconceived notion that E-courses are easier and do not require the time and discipline necessary to complete the course (Carnevale, 2000; Gibson & Gibson, 1995; Morris, 1999; Ziegler, 1999). These students usually drop the class after their initial experience and the realization of the time and effort that is required. Studies indicate that many students view on-line courses as more difficult than the traditional classroom approach because of the need for motivation, adequate computer skills, and the ability to absorb material in a less structured environment. Furthermore studies conducted to determine the integrity of on-

line courses determined they are as rigorous if not more rigorous than traditional courses (Barry, 1992; Emmons, 1999; Murphee, 1999; Snell & Allen, 1999; Snell & Mekies, 1999).

Predictors of Completion

The demographic characteristics of distance education students interact to influence persistence in their learning program. Some student demographic characteristics seem to readily predict persistence (Banas & Emory, 1998; Brawer, 1996; Carnevale, 2000; Merisotis & Phipps, 1999; Potts & Hagan, 2000; Roblyer, 1999; Wade, 1999). E-course students are viewed as more diverse in terms of age, culture and ethnic origin. Research indicates these students tend to be older, and have more professional experience. They have an internal locus of control for learning and they are also described as “part-timers” because of job and family commitments (Szulc, 1999). Colorado Community college identified seven characterizes typical of online students.

1. Older than traditional students
2. Independent
3. Motivated
4. Married
5. Employed with skills that need to be updated
6. Part-time students
7. Mostly women (Seehusen, 2000)

Student demographic information has gained attention in predicting attrition in distance learning programs. E-courses have experienced high attrition rates that can bear financial

ramifications on the institution (Szulc, 1999). Not all students perform or respond equally well in computer mediated courses and consideration should be made to evaluate students and their ability to learn and participate in an Internet based course.

Age

The literature suggests there are two groups of students to consider in Higher education. The traditional student is classified as young, usually straight out of high school, full time and attends classes on the physical campus. These students are generally the ones who require the socialization process that is lacking with on-line courses. The mature or non-traditional student is older, a full time employee and already seasoned to the college experience (Freddolino & Sutherland, 2000; Hibert, 1999; Stukel, 1998; Walston, 1999). Non-traditional students are defined as 25 years or older. Statistics provided by the National Center of Education Statistics (NCES), indicate that in 1997, twenty five percent of all undergraduates were over thirty and twenty three percent of all graduate students were over the age of 40. Approximately sixty percent of all graduate students were part time (Daviddow, 1996; Stukel, 1998).

This group of students represents the fastest growing population in higher education and was the group that E-courses were originally intended for (Elias, 1999). These students are significantly different from the traditional students in aspects including time management skills, study habits, motivation and commitment to learning (Elias, 1999; Hibert, 1999). A study conducted by Szulc (1999) indicates that successful E-course students tend to be older and have more professional experience. Szulc analyzed students enrolled in on-line courses and measured success as a grade of "C" or better.

Online education has been shown to be better suited for adult learners who are considered more disciplined and expect to develop fundamentals and gain skills on an independent basis

(Guernsey, 1998; Neumann, 1998; Morris, 1999; Phoenix Online, 1999). According to the University of Alaska President Jerome B. Komisar, the virtual university can be characterized as “At once a splendid and a naïve idea.” He believes the concept meets the needs of corporations and more mature individuals but is not suited to the needs of 18-year old students (Epper, 1999).

There must be a level of academic maturity, associated with critical thinking and an ability to synthesize information, for success in extensive online courses (Teaching at an Internet Distance, 2000). Immature students lack the autonomy required in a distance-learning program that leads to a higher drop out (Easterday, 1997). There must be a level of motivation to deal with the material and mode of delay. This level of required motivation can be categorized as a function of the student’s age, background and intellectual capacity (Szulc, 1999).

Adult learners may also be better served through on-line courses in terms of comfort levels associated with the traditional classroom. Older students do not feel adequate in a classroom of younger students and may find online courses more appealing (Easterday, 1997; Geber, 1999). Many universities that have on-line degree programs have confirmed the need for mature, older students to successfully complete an on-line education. These institutions have mandated specific age and admission requirements to dissuade younger less mature students from this mode of course delivery (Walston, 1999).

Younger students in their teens and twenties are at higher levels of risk of non-completion as compared to older students with better-defined career goals and the ability to work independently (Carr, 2000; Green, 1999). Extensive research conducted by Butron indicated that younger students had difficulty pacing themselves with the course and had to complete most of the coursework into the last two weeks of class. “It’s clear that these students require a more structured format than the self-paced, free-form process” (Butron, 1999). Younger students

simply lack the self-discipline and time-management skills necessary to complete the course. These students tend to get “lost in Cyberspace” since they do not receive the direct attention observed in a classroom setting (Carr, 2000; Murray, 1999; Neumann, 1998). The younger students in the Butron study indicated that E-courses were a learning experience in responsibility, independence and research (Butron, 1999). It is evident from the aforementioned study that the older student is better equipped for the college learning experience than the younger traditional student (Elias, 1999). Adult learners' are said to have a need for the autonomy, which provides a control of balance between independence, competence, and support in the learning process.

Gender

Student attributes including gender have been analyzed in predicting completion rates with other forms of distance learning. Women have played an important role in the growth and development of distance education. The increased level of participation by women can be attributed to political, social and economic changes of a women's position in the role of family and society (Hitchcock; 1999; Nasseh, 1997; Weber, 1999). Studies conducted with traditional students indicate that gender does play a role in predicting attrition. Research conducted at the University of Wisconsin in 1965-1966 indicates that gender, GPA and student major were key factors in determining success of freshmen students for the traditional campus (Coker, 1968). Additional studies have shown that retention patterns in all forms of education are affected by gender (Prather & Hand, 1986).

Distance education serves an important role in women's development. Women are constrained by time, space, resources and socio-economic disabilities. It enables them to learn at their own pace and time and take up vocations and skills important for economic and individual

development. Women fill multiple roles that contribute to their time and place constraints. They are unable to fit traditional study in their overburdened schedules (Thompson & McGrath, 1999).

Research in the field has shown that distance learning primarily attracts women with children. A recent demographic study indicates that women are as likely to use home computers for educational purposes and are targets for distance education (Blum, 1999). Bremner (1998) found that 66 % of the adult's involved in distance education are female and 80% of these students have children.

There is also evidence that suggests that males and females use the medium associated with E-courses differently. Men tend to view courses taken on the Internet as a means of providing education to the masses at a lower cost. They view the education process as a competitive framework that is a mode of elevating their own status or lowering that of their peers (Arbaugh, 2000). Women perceive Internet based courses as a mode of collaboration and support between students in the group. Women have been shown to participate more in-group discussions held on the Internet than in the traditional classroom. Research conducted by Elias (1999) suggests that female students are better prepared in written communications associated with an E-course than are male students who are better performers when communication orally as in the traditional classroom. A study conducted at Old Dominion, (1996-1997) of 16,500 distance learners in 25 different majors, indicates that women appear to perform better with distance education courses than their male counterparts (Koch, 1998). A study conducted by VanNess, VanNess and Adkins (2000) analyzed finance courses offered online as compared to the traditional classroom. Their study proved female students were more likely than males to complete the online course.

In contrast professors who teach online state they lose students to a variety of reasons but found marriage and pregnancy (family commitments) to be two common reasons for female students to drop out of the course (Carr, 2000; Thompson, 1997). Regardless, women view distance learning as a means of continuing their education as well as fulfilling their family responsibilities.

GPA

Problems with distance learning originate from the original correspondence course. Studies measuring retention rates in correspondence courses indicate that approximately 20% of the students did not initiate the course and never submitted coursework. Those students with higher GPA's tend to initiate the course early on and eventually complete the course (Parrot, 1995; Pedrini & Pedrini, 1977, Weidman, 1985). Those students with the lower GPAs committed to the course later in the time frame and many never completed the course work. Studies indicate that the time frame associated with initiating the course, as predicted through GPA, can be viewed as a predictor of completion or non-completion (Pfeifter, 1970). The study conducted by VanNess, VanNess and Adkins (2000) reported that GPA is a valid predictor of E-course completion. Their research reported that student's with higher GPA's were more likely to complete the online course with motivation and the desire to maintain a high GPA serving as the key factors in course completion.

Studies that measured student attributes including ACT scores, age and gender support the hypothesis that GPA is a predictor of student retention in distance education programs. Prather and Hand (1986) conducted studies that evaluated non-traditional students and retention rates. Their work suggests that GPA is a better predictor of persistence and completion of coursework as observed through various forms of distance learning.

Student's Major

Due to the nature of the delivery medium, there are subjects, which are more amenable to electronic delivery. Certain coursework is not readily adapted to E-course methodology and the associated technology. There are some courses that do not translate into the online environment. These courses require hands on application with a high level of peer review and collaboration (Bothel, 1999; Dixon, 1997; Morris, 1999b; Morrow, 1999; Rawl, 1999).

Technical and economic considerations including bandwidth and modem speed may constrain the development and implementation of these courses (Barley 1999). Skills development and information transmission may be limited based on the inherent nature of the medium of delivery. Some skills require the student to learn by doing, requiring “hands-on experience. Some courses require face-to- face interaction with the instructor and other students to develop comprehension of the course material and to develop an acceptable level of competency (Hassenplug & Harnish, 1998). Foreign language courses may be better taught in a classroom setting, where competency can be evaluated through the student’s speech (Carnevale, 1999).

Courses that emphasize memorization and regurgitation and can be graded by mechanical methods generally are typical of on-line courses (Neumann, 1998). Courses including mathematics and quantitative reasoning are adaptable to E-course format because of the measurable skills and the availability of learning materials and assessment tools (Epper, 1999). Courses in mathematics and chemistry have been shown to be effective as students are able to visualize and manipulate formulas and theorems through specialized computer software (Rawl, 1999). Currently there is a large demand for skilled workers with math, science and engineering backgrounds. Providing these courses on-line allows students the opportunity to develop the

skills and the ability to synthesize the knowledge that is desired in the workplace (Leonard, 1999). Business courses which are heavy on information and do not require discourse and deliberation between students are also said to be better suited for an online format.

Some courses may be easier to transfer to the Internet-based environment because of the nature of the coursework and the ease of conversion to a technology based medium. Courses that are not easily transferred should be evaluated for effectiveness and other methods should be incorporated that allow for delivery that meets the needs of the subject matter and the medium (Arbaugh, 2000; Kirkeby, 1999). A study conducted at Christopher Newport University (CNU) indicates that writing intensive courses had outcomes that were as good if not better than the traditional based course. Students had the ability to think and write critically and receive timely and evaluative responses to their work (Mulligan & Geary, 1999).

It can be surmised that some courses are more easily learned through an independent form of study but that some courses require the structure, deadlines and regular face to face contact possessed in traditional courses (Kirkeby, 1999; Saunders & Weible, 1999b). There will always be courses that are better suited to the traditional classroom and people who prefer to learn in these settings (Kirkeby, 1999; Morris, b, 1999).

Access to Technology

Even though there are a growing percentage of households with computers, access is still considered highly stratified based on socioeconomic class (Barley, 1999; Wright & Yates, 1999).

As with any technologically based medium there are disadvantages that hamper efficiency and effectiveness. Web based courses are highly technology dependent; therefore, the equipment used can be a critical factor in the quality of communications and transfer of information. Factors such as bandwidths and slow modems can hinder the delivery of sound video and

graphics (Higgins, & Bouvier, 1999; Mottl, 2000). The biggest complaint from on-line students is slow modems that can slow down the student class time (Higgins & Bourvier, 1999). The use of the Internet in delivering distance education courses and the availability of adequate technology has raised some concern regarding access to the technology and the concept of the digital divide (Epper, 1999; Enright, 1999; Kautzman, 1998; Roach, 2000; Roblyer, 1999; Romiszowski, 1993; Wright & Yates, 1999).

A study was conducted utilizing two statewide surveys, the Carolina Poll and the Indiana Poll. Multivariate analysis conducted on the data revealed that income, education, age and family structure are social factors that determine on-line access. The study also revealed that Internet use was lowest among single mothers, members of lower socioeconomic groups and older participants (Bucy, 2000).

Government reports indicate that although distance education has been advocated as a way to increase access to educational opportunities, the poor and less educated students are less likely to have access to computers or on-line services which has been noted as contributing to the low completion rate (Division of Government and Public Affairs, 2000).

On-line course navigation requires some level of cognitive ability or level of computer literacy that cannot be remedied through access to technology (Carr, 2000; Hofstetter, 1998). Learner success is highly dependent on technical skills in computer operations and the ability to navigate through the Internet. It has been shown that computing experience is a strong predictor of course success due to the positive attitude associated with computers and the frequency with logging onto the Internet and more time spent with the course (Arbaugh, 2000; Romiszowski, 1993). Previous research findings indicating a negative relationship between computer anxiety and computer experience was replicated for both young and older adults. The research findings

of Dyack and Al-War Smither (1992), indicates that older adults were less computer anxious and had less computer experience than younger adults. Furthermore, older subjects indicated they had greater pleasure working with computers than younger subjects. Other findings indicate that young males liked computers more than young females; however, there were no significant differences between older males and older females.

The technology utilized with on-line courses can also be a distracting factor in terms of information overload. The relay of information through e-mails, databases and websites demands a high level of information management skills that many students have not yet established (Schantz, 1999).

Employment

The individuals already employed and seeking skill updates and retraining were those students targeted by most institutions that offered distance education in 1995. This student population emerged as part-time and full time employees wishing to continue their education without time spent away from the job. (Becker, 1999; Banhazi, 1999; Guernnsey, 1998; Miller & Jones, 1999; Walston, 1999).

Thirty nine percent of institutions that offered distance learning programs targeted professionals seeking re-certification and forty nine percent targeted other workers who required skills in their present positions or who were considered displaced workers. Online learning allows these workers to maintain employment while pursuing an education at their own time and place. The Apollo Group is an example of an online program that targets the professional adult seeking advanced education. The Apollo group currently offers the only accredited online MBA program in the United States. The average student is 40 years old and is employed in a management position with a salary in the range of \$70,000-\$100,000. These students are

motivated to complete the coursework based on career aspirations and the pretense that their education is funded through their employer. This group of students consists of professionals who are older than twenty-five and seeking continuing education to help in their careers. They perceive E-courses as having the potential to make an immediate impact on their careers. These students have the ability to continue working at their job while they pursue a degree or professional certification (Bothrun, 1998; Gotschall, 1996). The majority of students enrolled through the University of Phoenix are employed full time. The aim of their program is to target older professionals who cannot take time away from their jobs or their families. Their average online student is 36 years old, has worked for 12 years, and earns \$75,000 (Walston, 1999). This program attracts older working students with approximately 60% of their tuition provided by the employer (Freedman, 1999). Research conducted by Bothrun (1998) reported that employed professional students were the most responsible, asked sensible questions, and accessed the material in a timely manner. These students were clearly motivated to learn and apply the course material and had no problems with the online format.

Summary

Research on the relationship between student characteristics and the learning issues associated with E-Courses can guide planners and instructors in enhancing students' learning experiences through appropriate course design, student support, and instructional strategies. Technology continues to have a formidable influence on education, expanding the range and quality of instruction that is available to academic institutions. E-courses are an extension of technology, incorporating the Internet as a medium of exchange. On-line course work is attractive to a several audiences for a variety of reasons. Students have the freedom of choosing their own time and locations to engage in coursework that is necessary for lifelong learning.

Questions regarding the quality and quantity of learning that occurs utilizing the Internet as a medium for distance learning have been posed and defended by many educators. University administrators need to comprehend the benefits of such a program and the types of students that are involved with this form of education. There is a potential student base that can be served through on-line distance programs that overcome the boundaries of a traditional based education.

One area of concern to administrators, educators and the general community is the low completion rate associated with this form of independent learning. Administrators and educators are intent on determining student factors that predict and lead to success with on-line learning. The basis of this study is to identify student characteristic's that can be measured and used to predict completion or non-completion of E-courses. Once these factors have been identified they can be utilized in pre-admissions screening for high-risk students, proactive counseling and support, and strategies that maximize retention and contribute to satisfying and effective distance learning.

Institutional leaders are required to develop goals and strategies that identify with the mission of the institution in providing quality education to their customer, the student. The administrative theory developed by Gulick and Urwick (1937) clearly defines the necessary functions of planning, organizing, staffing, directing coordinating, reporting and budgeting. Recognizing and implementing these functions in developing and maintaining an Internet based program is essential to ensure success of the program and to maintain the standards of the institution. E-courses are essential to the survival of some institutions since they are utilized as a tool to increase enrollment. Administrators must be aware of the courses and degrees that are being offered on the World Wide Web and respond with the appropriate administrative functions

to remain competitive in the area of technology while maintaining course quality (Banas & Emory, 1998).

As trustees and presidents create a vision of how the institution will provide education, they should consider the following factors:

1. Which methods best fit the educational purposes of the faculty, academic disciplines and colleges.
2. What mix best fits with the institution's mission and educational values.
3. What kinds of students can benefit from distance learning and E-courses (Gilbert, 1999).

Specific academic goals relative to Internet education must permeate throughout the mission, the planning and the objectives of the institution. Planning for new technologies and internet based courses is necessary to provide an enhanced environment that supports a range of students that wish to actively engage in the learning process (Nixon et al, 1999). Faculty members must be prepared to design, teach and evaluate an on-line course. A course must be properly developed to provide students' the opportunity to participate and learn utilizing this form of course delivery (Loeding & Wynn, 1999). A poorly planned or mismanaged technology based program can wreak havoc on an institution's distance learning program.

Organizing requires administrators to determine problematic areas in the preparation and delivery of on-line courses. Bandwidth, modems, hardware and software requirements must be established to allow the student the opportunity to access the technology and the materials that are necessary to complete the course. There must be strategies to determine how to develop the

technology and incorporate it in the curriculum so that the course fits the medium of communication.

Staffing issues must be addressed relative to meeting student needs and providing an efficient and effective medium of course delivery. Faculty must be available to design, implement and maintain electronic courses. In order to provide students with an element of the social context of interacting and socializing requires faculty that have the time and desire to respond to the distance learner.

Directing is another administrative function that is necessary to put established action plans in motion. Staff development through in-services, developmental programs and seminars are necessary for designing and implementing E-courses. Technology based staff must be available to provide direction and support to the teaching staff in creating an Internet based course. The technology staff is necessary to facilitate and monitor the implementation of the E-course program. They must ensure adequate training, provide the ability to detect problems and make recommendations.

Coordinating the staff and the institution is a function that provides a creative and stimulating environment to enhance the educational process. All staff members involved in the process should be aware of the need to provide students with state of the art technology, skills and knowledge that can supplement the educational process. There must be successful integration of resources and services to provide the commitment and dedication that is necessary for students to complete the coursework. Higher education must achieve a balance, to meet the educational needs of today's society while maintaining an integral and respected program

Budgeting and financial planning is key to the success of any Internet program. Information technology requires funding for equipment, software, the infrastructure and user

support. Technology requirements are constantly changing and require frequent expenditures that are costly to the institution. The financial model of the institution must incorporate purchase policies and maintenance strategies to manage costs and maintain the proper infrastructure.

Administrators must be aware that investments in technology are essential in fulfilling the goals and objectives set forth by the institution in providing quality education (Banas & Emory, 1998).

The concept of distance education is more likely to be accepted if it is perceived to be compatible with the institution's mission and is viewed effective in providing quality education that is cost effective (Chang, 1998).

The basis for this study is to examine student attributes that contribute to completion or non-completion of E-courses. Academic institutions are competing for federal and state funds for survival. Research and grant money is essential to the growth and development of the institution. There are issues that center on E-courses that can impact the funds received by the government. The "50- percent rule" is an example of such an issue. This rule requires 50% of all coursework be completed on the physical campus in order for the institution to participate in federal student aid programs. (Dervarics, 1998; McQueen & Wright, 1999).

To remain competitive institutions must incorporate the use of technology while maintaining product quality. Student enrollment and retention are critical factors in determining the institution's source of federal funds. Information technology and the ability to provide a quality on line program can enhance an institution and provide economic benefits. It is important that institutions look at the students who register for these courses and monitor their completion rates. Those courses, which are deemed not suitable, should be eliminated or formatted to a T- course format that requires visual meetings and some level of interaction with the instructor.

Administrators including the Board of Trustees, the president, deans and department chairs should be aware of the administrative functions and the role they need to play in the instigation and development of any distance-learning program. An Internet based program has advantages and disadvantages as a source of education to distance learners. All officials must be receptive to this form of learning and look for better ways to ensure student success in this ubiquitous learning environment.

CHAPTER III

Methodology

The purpose of this study is to determine student attributes that predict E-course completion. The research has been designed with the key question of course completion as the basis. The study examined courses taught through the Internet (E-Courses) and the demographic characteristics of the student that can be used as predictors of completion. Data for this study was drawn from the Marshall University Institutional Research Board. The data includes the semesters between spring 1998 and fall 2000. The time frame selected reflects the initial E-course offerings at Marshall University to the present semester. The study analyzes the student attributes of age, gender, GPA, student major, access to technology and employment and attempts to correlate these factors with E-course completion.

Population and Sample

The data was compiled by the Institutional Research Center at Marshall University. Because of issues relating to The Family Education Rights to Privacy Act (FERA) (Buckly Amendment) (1998), it was necessary to receive permission to obtain the data and to provide a guarantee of complete anonymity.

The population for this study includes undergraduate students and graduate students at Marshall University who have registered for an E-course offering through the various colleges. Marshall University currently has 134 E-courses sections. These courses are offered through the following colleges: Lewis College of Business, Community and Technical College, College of Education, College of Fine Arts, Graduate College, College of Liberal Arts, and College of Science.

Appendix A contains a list of the course offerings at Marshall University to be included in the study. The courses are designated by, course department, number and course description with many of the courses differentiated from the traditional based course with the “E” marking.

The population and the sample for this study includes N= 3453 students who have registered for an E-course offering through Marshall University between fall semester 1998 and fall semester 2000. The data reflects some variation of content within the various colleges. By the nature of the study, all usable student demographics were included, precluding a random sampling process. This study utilizes a convenience sample that is not scientifically drawn. Over Eighty percent (80%) of the studies conducted utilize this method in research analysis (Schmitt & Klimoski, 1991 pg381).

In order to obtain data regarding access to technology and employment issues required a survey of a random sample of the population. In order to provide an adequate sample of the population it is recommended that 2-5% of the population be considered in the sample. In order to eliminate some degree of generalization issues inherent to this type of research, the study includes the higher limit as the percentage to survey (Kerlinger, 1986). According to the law of large numbers, the larger the sample size the closer the sample will be to the population and the less likely chance will account for the statistical relationships.

A telephone interview was chosen as the survey method for obtaining the technology and employment data. Telephone surveys are regarded as an effective and efficient method of survey (Schmitt & Klimoski, 1991 pg 140). This method of surveying is administered quickly and allows for clarification by the researcher. Telephone surveys are also said to have a good response rate. The telephone survey requires identification of the researcher and an explanation of the study and why it is being conducted. The students were asked two questions that required

a yes or no response. The first question inquired if the student was employed while registered for the E-course. The second question inquired if the student had access to computer technology as described in the operational definitions.

The sample selected for the telephone survey was randomly selected through a random number generator supplied by a data analysis tool incorporated in Microsoft Excel. A response rate of 90% or greater is considered significant based on the 50% plus one rule.

Appendix A contains a list of the course offerings at Marshall University that were included in the study. The courses are designated by semester, course department and number, section number and differentiated from the traditional based course with the “E” marking.

Design

This study utilized analytical statistical methodology to answer the theorized research questions and develop the variable relationships. Non-experimental designs are weak in terms of providing a basis for making a strong argument, however if done properly, relational research can result in useful and valid knowledge. These studies are perceived as the easiest, less costly and most prevalent type of research plan used (Stanley & Campbell, 1964). When data are obtained on more than one variable it is possible to index the variables relative to each other. This relationship can be established through the use of regression analysis. Kerlinger (1986, p9) states that interrelated constructs and propositions can be specified to present a systematic view of phenomena by indicting relationships among the variables with the purpose of explaining and predicting the outcome. The basis for this study was to correlate student attributes with E-course completion. A conceptual framework has been established and a large sample of student data has been incorporated in the regression model. The student demographics described as the independent variables were analyzed to determine the relationship, if any with the dependent

variable. This type of research design provides a basis for identifying and explaining the variables and determines any patterns or trends that exist.

This study incorporates ex-ante data that was obtained from the Marshall University computing office and the Marshall University Institutional Research Board. The basis for this study was to correlate student demographic characteristics with E-course completion. The data was extracted from student demographics provided by the Marshall Institutional Research Board. Due to confidentiality issues in conjunction with the Family Education Rights to Privacy Act (The Buckly Amendment of 1998) the data containing GPA was specifically coded in reference to the final grade received in the course. The information was provided in two data sets allowing for GPA confidentiality and providing pertinent student demographics required of any student registering with the university and necessary for the study. These demographics include age, gender, student major, address and telephone number in conjunction with the final grade in the course. The information relevant to student GPA, includes the final grade in the course, designated as a letter grade of “A” through “F” or a grade of incomplete or withdraw from the class.

The study incorporates a comparative and correlation design to explore the relationship between the aforementioned independent variables with the dependent variable of E-course completion. This study gathers descriptive information from students who have registered for E-courses and correlate these variables to E-course completion.

The objective of this research was to determine whether and how many of the aforementioned independent variables relate to course completion. From the pattern of the correlations, inferences and potential explanations can be made. This study is fundamentally a

relational study attempting to build a causal model that describes the relationship among the student variables in predicting E-course completion.

Validity

The nature of this study dictates the type and level of validity issues that may require some level of justification. This research study attempts to overcome areas of concern relative to face validity, content validity and construct validity.

Issues of face validity in this study arise from the choice of independent variables selected as predictors of E-course completion. The student demographics described as the independent variables in this study have been recognized as predictors of student achievement and completion when predicting other forms of distance learning and traditional forms of learning. Content validity can also be questioned relative to the sample size and the ability to generalize the test findings.

The validity of the measure of the variables is also addressed in this type of study. Construct validity issues may be challenged in terms of predicting E-course completion with the constructs that have been described in this study. In order to confirm the validity of this research design Pearson's r was determined as an assessment of the construct validity of this study.

Data Analysis

The data was coded into a flat file and extrapolated utilizing SPSS (Statistical Package for the Social Sciences) version 10.0. The method of statistical analysis incorporates correlations to describe the relationship that exists between the independent variables (student attributes) and the dependent variable (course completion). The demographic data were correlated with the dependent variable of E-course completion. Analysis was conducted utilizing a logistic regression model. The primary reason for using logistic regression is that the data are discrete

and there are numerous issues involved in the analyses that can be incorporated into a single analysis to answer questions that have been approached in this study (Schmitt & Klimoski, 1992, pg, 75). This required a simple analytical model that allowed for continuous outcome measures, providing a means of maximizing the prediction of the various outcomes in order to rest the plausibility of the theories presented in this research. The model was cross-validated in order to predict the outcome of course completion.

Logistic regression techniques were utilized to predict course completion based on the selected independent variables and the dichotomous nature of the dependent variable (Agresti & Finlay, 1997). Stepwise regression was also utilized to analyze the impact of the demographic variables individually and in interaction with the other variables as a group.

The Regression model is stated below.

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + e$$

Y=Predicted completion of E-courses

X1 = Age

B0= Intercept Value

X2 = Gender

B1=Regression weight for Age

X3 = GPA

B2=Regression weight for Gender

X4 = Access to technology

B3=Regression weight for GPA

X5 = Employment

B4=Regression weight for Access to technology

B5=Regression weight for Employment

e= Standard error of estimate

Logistic regression was used to determine the relationship that exists between the various independent variables as described by the student demographic characteristics and the dependent variable of course completion. A summary of the regression results was reported in an Analysis of Variance (ANOVA) format. This methodology was utilized in order to determine relationships between the variables.

This study has been demonstrated to be a one case shot study, as defined by Campbell and Stanley (1963). The format of this study evaluates the process of comparison, recording differences and making appropriate contrasts.

Summary

The basis for this study is to show the relationship that exists between the contended independent variables described as student demographics relating to E-course completion and the dependent variable of success denoted by completion of the course. The study utilized data from the spring of 1998 through the fall semester of 2000. This period of time was investigated as the initiation of the E-course program at Marshall University and the last complete semester where the data was readily available.

Chapter IV

Presentation and Analysis of the Data

The basis for this chapter is to present data collected on E-course demographics and indicate through statistical analysis, which demographics are predictors of E-course completion. The findings were interpreted to form conclusions in reference to student completion of E-courses. The analysis of the data includes the development of descriptive statistics and examinations of inter-correlations present among the study variables. The analysis is organized based on the specific research objectives of this study as outlined by the research questions. The purpose of this study was to predict completion of E-courses by analyzing student demographics as possible predictors.

The data were examined to determine which factors contribute to successful completion as individual predictors or as clusters. The data were obtained in a flat format file and imported and analyzed utilizing the Statistical Package for the Social Sciences (SPSS) version 10.0. The data were coded to reflect the dependent variable, student completion, as the minimum score (1) and non-completion as the maximum score (2). The independent variables were coded in a similar manner with a score of (1) reflecting female, access to technology and employment and a score of (2) indicating male, no access to technology and non-employment. The chapter also includes the following sections: (a) descriptive data, (b) major findings, (c) ancillary findings, and a chapter summary.

Descriptive Data

The data utilized in this study incorporates demographic data of N = 3453 students who registered for an E-course between the spring semester of 1998 and the fall semester of 2000. All courses offered in an E-course format were included in the study.

The population and sample for the data compiled to analyze age, gender, student major and GPA, consisted of N=3453 students. Data relating to access to technology and employment were randomly selected from the same population with a sample of n=555 students. All colleges offering E-course sections are included in the study. The colleges that had E-course offerings at the time of the study include the College of Business, the College of Education, the College of Liberal Arts, the College of Science, the Community and Technical College and the Graduate College. The study included both graduate and undergraduate student demographics.

A general analysis of the data presented, offers several important insights. Several methods of statistical methods were utilized to analyze the data in order to establish relationships between the study variables. An initial investigation of the data reveals the basic descriptive statistics of frequency, mean, medium and mode and standard deviation. Correlation analysis was utilized to indicate the relationship and strength of the relationship that exists between the independent variables (student attributes) with the dependent variable (E-course completion). The attribution of correlation indicates the possibility of a causal relationship between the independent and dependent variables (Schmitt & Klimoski, 1992).

The independent variables were also categorized based on the analysis of variance technique (ANOVA). The analysis was included to measure the statistical difference between the means of two or more of the student variables and thereby providing a test of the significance of the effect of the independent variables (Cohen & Cohen, 1983). The power of the test

indicates there is a significance difference between the means. All comparisons related to completion of E-courses and each of the independent variables were tested for significance using the t-test.

Regression analysis was performed to indicate the value of the independent variables as predictors of E-course completion. Regression analysis determines the effect of the independent variable on the dependent variable, allowing for a prediction of the outcome in order to test the plausibility of the dependent variable. (Schmitt & Klimoski, 1992 pg 59). Multiple Logistic Regression was the appropriate method of analysis as determined by the number of independent variables and the dichotomous nature of the dependent variable. In dealing with research studies centered on human characteristics, there is likely to be several independent variables, which are useful in predicting the expected outcome. Multiple Logistic Regression was utilized to establish such a relationship between the described student demographics and E-course completion.

Major Findings

Research Question One

What is the relationship, if any, between age and student completion of E-courses at Marshall University?

E-course completion rates at Marshall University are described in Table 1. Completion, as defined in this study, is a grade of “D” or better. The data were coded to represent completion or non-completion, reflecting the dichotomous nature of the dependent variable. Individual course grades were coded on a scale of 1-5. A score of (1) represents an “A” and a score of (5) indicates “W” (withdraw). The research questions analyzed in this study are configured based on the established coding criteria (Table 2).

Table 1. Frequency Statistics for E-course Grades (N = 3453)

Grade	Frequency	Percent	Valid Percent	Cumulative Percent
A	405	11.8	11.8	11.8
B	767	22.2	22.2	33.9
C	572	16.6	16.6	50.5
D	95	2.8	2.8	53.3
F	1099	31.8	31.8	85.1
W	515	14.9	14.9	100

Table 2. Frequency Statistics for E-course Completion (N =3453)

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Completion	1839	53.3	53.3	53.3
Non-completion	1614	46.7	46.7	100

The student age distribution for students attempting E-courses is listed in Table 3. The mean age for E-course students is 27.25 years with a median age of 23 and a mode of 20 years. The overall range for E-course students is 16 to 64 years old. Correlation analysis was performed to indicate a relationship that prevails between age and E-course completion. The analysis of the data indicates that age is positively correlated with E-course completion with a significant correlation factor ($R = .2263$, $p < .01$). Table 5 provides the correlation factors determined to be associated with age and E-course completion. The difference between the means revealed that there is a significant difference between age and student completion $t = -14.478$ $p < .01$.

Table 3. E-Course Descriptive Statistics for Age, GPA and Course Grade (N=3453)

Variable	Mean	Median	Mode	Minimum	Maximum	Standard Deviation
Age	27.25	23	20	16	64	9.06
GPA	2.55	2.62	3.00	0.00	4.00	0.87
Grade	1.76	2.00	0.00	0.00	4.00	1.70

Research Question Two

What is the relationship, if any, between gender and student completion of E-courses at Marshall University?

Frequency distribution analysis data reveals that female students are more likely to be enrolled in an online course as compared to their male counterpart. The ratio of female to male students attempting E-courses is 51.5% females and 48.5% males. This corresponds to the traditional Marshall University population of 54% females and 46% males.

Table 4. Frequency Statistics for the Gender Variable (N=3453)

Variable	Frequency	Percent	Cumulative Percent
Gender			
Female	1779	51.5	51.5
Male	1674	48.5	100

As observed in Table 5, there is a significant relationship between gender and completion ($R = 0.073$, $p < .01$). A significant relationship was observed through one-way analysis of variances (ANOVA), which was used to determine if there was a significant difference between the mean scores of gender and E-course completion ($t = 4.400$ $p < .01$). Based on the data

included in this study (Table 5), there are significant differences in female and male students in terms of successful completion of E-courses. The data indicates that females are more likely to enroll in online courses and successfully complete the course.

Table 5. Correlation Between Age and Gender and Completion (N = 3453)

Variable	R	t-value	F-Ratio	P
Age	-0.263	-14.478	209.619	.010*
Gender	0.073	4.400	19.361	.000*
GPA	-.44664	-30.208	912.533	.000*

- Significant ($P < .01$)

Research Question Three

What is the relationship, if any, between student GPA and student completion of E-courses at Marshall University?

GPA data was the most complicated data to receive based on confidentiality issues and the Family Education Rights to Privacy Act (FERPA) (Buckly Amendment) (1998). The data were correlated with course completion, age and major and coded to ensure student confidentiality. The descriptive statistics associated with GPA are found in Table 5. The overall range of GPAs for students attempting E-courses is 0.00 to 4.00. The mean GPA of on-line students is 2.55 with a median GPA of 2.62 and a mode of 3.00. Correlation studies indicate a positive relationship exists with E-course completion and GPA with $R = -.44664$, $p < .01$. The negative relationship observed with the correlation is based on the coding of student completion as a minimum value rather than the maximum value. This relationship was also supported by ANOVA analysis with a factor of $t = -30.208$, $p < .01$. This supports previous research that

indicates students with higher GPAs tend to be more motivated and are better suited for coursework presented in an independent environment.

Research Question Four

What is the relationship, if any, between student major and student completion of E-courses at Marshall University?

The data for student major was coded into six distinct categories. The designation for the categories was based on defined college categories described by Marshall University. These categories include the College of Business, The College of Liberal Arts, the Community and Technical College, the College of Science, the College of Fine Arts and the Graduate College. The categories were correlated with E-course completion to determine if student major as classified by the described groups (Table 6) would provide a basis for predicting E-course completion.

Table 6. Frequency Distribution of Student Major Categories (N=3453)

Major	Frequency	Percent	Valid Percent	Cumulative Percent
Business	897	26.0	26.0	26.0
Education	161	4.7	4.7	30.7
Liberal Arts	1018	29.5	29.5	60.2
Science	711	20.6	20.6	80.8
Community & Technical	533	15.4	15.4	96.2
Fine Arts	48	1.4	1.4	97.6
Graduate	85	2.4	2.4	100

Frequency distribution analysis indicates the concentration of E-course students are classified in the College of Liberal Arts (n = 1018 students). Included in the classification is the Regents B.A. program, which accounts for n = 302 of the student population involved in this study. Each college was analyzed against course completion in order to determine which majors as classified by the college categories were better suited for on-line learning. ANOVA analysis also indicated significant differences between the student major categories. Table 7 provides a summary of the relationship of each college category with course completion.

Table 7. Correlation Analysis of Student Major and Completion Based on College Categories (N=3453)

Variable	R	t-value	F-Ratio	P
Business	.094	132.146	24.993	.000*
Education	-.005	-.278	.077	.781
Liberal Arts	-.003	-.179	.032	.858
Science	-.80	-4.266	18.196	.000*
Community & Technical	-.10	-.520	.270	.603
Fine Arts	.046	2.460	6.052	.014
Graduate	-.064	-3.387	11.474	.001*

*Significant (p< .01)

Based on the data provided in this study, it would appear that students who are business majors are positively correlated with completion (R = .094, p< .01). The student major categories that are positively correlated also showed significant difference between the student

major and completion as described in Table 7. This would support previous research that indicates business courses that are heavy on information and to not require discourse and deliberation are better suited for an online format. Previous studies indicate that some courses require some degree of student interaction and the ability to correspond directly with the professor. These courses are representative of the student major categories of education, liberal arts, community and technical and the fine arts.

Those students with science-based majors are positively correlated with completion ($R = -.80, p < .01$), indicating that these students are more successful with online learning. This data confirms the literature which suggests that science and mathematic based courses have been shown to be effective in this form of learning as students are able to visualize and manipulate formulas and theorems through specialized computer software (Rawl, 1999).

Research Question Five

What is the relationship, if any, between access to technology and student completion of E-courses at Marshall University?

The data utilized in the analysis of this research question was dependent on a random sample telephone survey. A random sample, consisting of 555 students was obtained through a random sampling routine included in Microsoft Excel software. The students in the sample were asked if they felt they had 24-hour access to computer technology while they were registered for the E-course. The respondent was merely required to answer yes or no. Based on the binary response the information was coded and correlated against E-course completion. Table 8 indicates 51.5% of the students surveyed stated they had access to computer technology while enrolled in the E-course. Access to technology was positively correlated with completion rates, with a correlation factor of $r = .398, p < .01$ (Table 10). This correlation suggests that students

who are exposed to computer technology and have the necessary access are more likely to successfully complete the E-course. The analysis of the variance between the means of access to technology and student completion revealed significant difference ($t=10.180$ $p \leq .01$)

Table 8. Frequency Distribution for Access to Technology (n=555)

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Access to Technology				
Access	286	51.5	51.5	51.5
No Access	269	48.5	48.5	100

Table 9. Frequency Distribution for Employment (n=555)

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Employment				
Employed	291	52.4	52.4	52.4
Not Employed	264	47.6	47.6	100

Table 10. Correlation Analysis of Access to Technology and Employment with E-Course Completion (n=555)

Variable	r	t-value	F-Ratio	P
Access to Technology	.398	10.180	103.628	.000*
Employment	.351	8.807	77.564	.000*

*Significant ($p < .01$)

Research Question Six

What is the relationship, if any, between employment and student completion of E-courses at Marshall University?

The data utilized in the analysis of this research question was drawn from the same random sample that was utilized in the prior question. The students were asked if they were employed while enrolled in the E-course. The question required a binary response of yes or no. Frequency distribution of the sample ($n=555$) indicates that 52.4% of the students were employed while enrolled in an E-course (Table 9). The data was correlated against E-course completion rates to indicate the relationship that exists between employment and E-course completion. E-course completion is positively related to employment ($r = .351, p < .01$). This correlation would suggest students who are employed, may have a higher level of motivation to complete the course. The difference between the means of the two variables is significant ($t = 8.807, p < .010$) indicating a positive relationship between working students and E-course completion. This motivation could be the result of reimbursement practices by the employer or the possibility of career advancement.

Regression Analysis

The aforementioned data analysis relates to co relational data of the various independent variables with the dependent variable of E-course completion. The value of this study is to utilize these co relational demographics and determine a model that can be used to predict successful student completion of E-courses. Regression analysis is a statistical tool that is used to predict dependent variables and to test the research questions (Kerlinger & Pedhazur, 1973). Regression analysis provides information on the statistical significance of the independent variable, the strength of the association between the independent variables and the dependent

variable, and provides a predictive equation for future studies (Kerlinger & Pedhazur, 1973). Due to the dichotomous nature of the dependent variable, logistic Regression techniques were utilized to predict course completion based on the selected independent variables. A generalized linear regression model was established to predict success or failure through the explanatory independent variables. Regression analysis was performed on each independent variable and then in clusters of specified groups of the variables. This provided a more constructive method of interpreting the data and allowed for an organized method in evaluating the dependent variable. Regression analysis was performed on the following independent variable clusters: Age, gender and GPA, access to technology and employment, and student major as designated by the seven college categories.

The first category of variables including age, gender and GPA, were entered as individual variables and then measured as a cluster utilizing the stepwise method. The model summary for each individual variable is depicted in Table 11, Table 12 and Table 13. Each student variable, as an individual predictor variable, was significant at $p < .01$ as a predictor of the criterion variable described as E-course completion. Gender and GPA, as a cluster, are significant in predicting student completion at the $p < .01$ level with $R^2 = .200$. Age was excluded from the model due to the inter-correlation that exists between the variables. While each variable is valid and is a significant predictor as a single variable, as a cluster of three variables there is some degree of overlap between the variables. When these conditions occur, the variables are said to be predicting the same criterion variance (Schmitt & Klimosk, 1992).

Table 11. Summary of Regression Analysis for Age, Gender and GPA as Individual Predictors of E-course Completion (N=3453)

Variable	B	SE B	β	P
Age	-.015	.001	-.263	.000*
Gender	.270	.061	.073	.000*
GPA	-.951	.031	-.447	.000*

Table 12. Summary Regression Analysis for Age Gender and GPA (Cluster) as Predictors of E-course Completion (N=3453)

Variable	B	SE B	β	P
Gender	.0735	.055	.020	.000*
GPA	-.948	.032	-.444	.000*

Excluded Variable: Age

*Significant (P< .01)

The importance attached to student major can also be a factor in predicting student completion rates. Certain courses are viewed as more adaptable to this format of delivery and the student's major determines the courses that a student will attempt to undertake utilizing computer technology. Regression analysis was performed utilizing dummy variable coding in order to generate information about the number of groups in a series of dichotomies. This process allowed for the analysis of the nominal variable, as categorized through the established college classification, using regression techniques. Each student major category was observed and measured against student completion. Table 13 shows the model summaries established for the individual student major variables.

Table 13. Summary of Regression Analysis for Student Major Categories (N= 3453)

Variable	B	SE B	β	P
Business	.107	.021	.094	.000*
Education	-.011	.038	-.005	.781
Liberal Arts	-.038	.021	-.003	.858
Science	-.097	.023	-.080	.000*
Community & Technical	-.014	.027	-.010	.603
Fine Arts	.263	.107	.046	.014
Graduate	-.207	.061	-.064	.001*

*Significant ($P < .01$)

Regression analysis was performed with the variables of age, gender, GPA and each student major category as a cluster to determine the best combination to predict success. The following model summary depicts the best linear relationship that was extrapolated from the research data.

Table 14. Summary of Regression Analysis for Age, Gender, GPA and Student Major Categories (N= 3453)

Variable	B	SE B	β	P
Age	-.107	.021	.094	.000*
Gender	.270	.061	.073	.000*
GPA	-.945	.031	-.440	.000*
Graduate	-.207	.022	-.080	.001*

*Significant ($P < .01$)

Access to technology and employment were also analyzed as predictor variables in E-course completion. The variables were computed on an individual basis and as a cluster. They were also analyzed in conjunction with age and gender to predict a possible relationship with student completion.

Table 15. Summary of Regression Analysis for Access to Technology (n=555)

Variable	B	SE B	β	P
Access to Technology	.398	.039	.398	.000*

*Significant ($p < .01$)

Table 16. Summary of Regression Analysis for Employment (n=555)

Variable	B	SE B	β	P
Employment	.351	0.40	8.807	.000*

*Significant ($p < .01$)

Table 17. Summary of Regression Analysis for Access to Technology and Employment (Cluster) (n=555)

Variable	B	SE B	β	P
Access to Technology	.314	.040	.314	.000*
Employment	.243	.040	.243	.000*

*Significant ($p < .01$)

Ancillary Findings

Inferences on the hypothesized research questions were established based on the various statistical techniques utilized in this research. Analysis of the data revealed additional student attributes, which provided additional merit to this study. Frequency analysis of the various student majors created a summary measure that established interpretive information on the

independent variable. The student major that represented the largest group of E-course students was classified as the Regents, B.A. Degree (n=302). This program of study is categorized in the College of Liberal Arts. Students attempting the Regents, B.A. degree, are often characterized as the mature non-traditional students who are employed while attempting coursework. These students typically utilize work and life experiences in order to gain college credit (Marshall University-Undergraduate Catalog, 2001). Correlation analysis indicates that a student major of Regents, B.A. is positively correlated with completion ($r = -.100$, $p < .01$). Regression analysis was performed on these data because of the unique nature of these students and the tendency to exhibit particular student attributes characterized in this study. The analysis indicates that these students, by virtue of their age, employment status and their strong desire to obtain a degree, are more likely to successfully complete an E-course.

Table 18. Correlation Analysis of Regents, B.A. to E-course Completion (n=302)

Variable	R	t- value	F-Ratio	P
Regents, B.A.	-.100	-4.880	23.815	.000*

*Significant ($p < .01$)

Table 19. Summary of Regression Analysis for Regents BA Student Major (n=302)

Variable	B	SE B	β	P
Regents BA	-.152	.031	-.100	.000*

*Significant ($p < .01$)

Another finding, not directly suggested in the research study, was compiled through an analysis of undergraduate and graduate students as two separate groups. This finding is based on the demographic make-up of the two groups of student and their perspective on course completion. Undergraduate and graduate students were analyzed in the same data set. The differentiation between the two groups was not included as a variable in the original study. After extracting the data, further analysis indicates that graduate students are more likely to complete E-courses (Table 14) and there is a positive correlation with E-course completion ($r = .207$, $p < .001$). The basis for this finding may be related to the independent variables of age and employment, since many graduate students are considered more mature in age and many are full time employees (Mission of the Marshall University Graduate College, 2001). These ancillary findings may warrant further investigation with additional research and a varied data set.

Summary of the Chapter

From an overall perspective, the value of this study lies in the ability to determine student success with E-courses. E-course completion rates as correlated and predicted by specific student demographics were analyzed to determine if there are statistical relationships between the independent variables of age, gender, GPA, student major, access to technology and employment with E-course completion rates. The study included 196 courses offered via the Internet, between spring semester 1998 and fall semester of 2000. All student demographics from the 3453 students who registered for an E-course offering were included in the analysis.

Age and GPA were student demographic variables that are shown to have the most impact in developing a relationship with successful E-course completion and are regarded as strong predictors of completion.

The factors of access to technology and technology were also instrumental in predicting successful E-course completion. The independent variables were also significantly correlated with E-course completion indicating a co relationship between the variables.

In summary, the data reveals that students enrolled in E-courses are more likely to be older and more likely to be female. The data imply that E-course completion can be predicted based on specific student demographics. The data did support that specific student majors are relevant in predicting course completion and are positively correlated with completion rates.

CHAPTER V

Summary of Study, Conclusions and Recommendations

This chapter states the purpose of this study, a summary of the procedures involved in the study and a summary of the descriptive data that was analyzed. Measures of the constructs take on additional meaning after the data has been collected and analyzed. The findings of the analysis were interpreted to form conclusions about the variables described in this research. A summary of the findings and the conclusions are presented in reference to the research questions. The chapter also includes implications for the study relative to higher education administration and recommendations for future research in the area of electronic course (E-course) studies.

Purpose of the Study

The purpose of this research was to identify and investigate student attributes that contribute to success in the completion of E-courses. The following research questions and the student demographic data provided a basis for the study:

- Q1. What is the relationship, if any, between age and student completion of E-courses at Marshall University?
- Q2. What is the relationship, if any, between gender and student completion of E-courses at Marshall University?
- Q3. What is the relationship, if any, between GPA and student completion of E-courses at Marshall University?
- Q4. What is the relationship, if any, between student's major and student completion of E-courses at Marshall University?

- Q5. What is the relationship, if any, between access to technology and student completion of E-courses at Marshall University?
- Q6. What is the relationship, if any, between employment and student completion of E-courses at Marshall University?

Summary of Procedures

This study analyzed student attributes in determining factors that lead to successful completion of E-courses. The independent variables were determined based on previous research that explored these demographics as possible determinants of distance learning in all forms. E-courses were analyzed from the spring semester of 1998 through the fall semester of 2000. The courses were offered through various colleges at Marshall University. The population and the sample consisted of N= 3453 total students. Random sample procedures were used to obtain data for access to technology and employment information (n=555).

Each semester data is obtained on students who register and attempt E-courses at Marshall University. The information is handled in a confidential manner and maintained by the Marshall University Office of Institutional Research. The raw data were compiled and coded by the Marshall University Office of Institutional Research. The data were coded to preserve student confidentiality, as required by the Family Education Right to Privacy Act (FERPA) (Buckly Amendment) (1998). The student data obtained from the Marshall University Office of Institutional Research includes the demographics of age, gender, student major and GPA. The data in raw form were recorded into a flat file text format and transferred to the Statistical Package for the Social Sciences (SPSS) software program version 10.0. The data were coded to reflect the dependent variable, student completion, as the minimum score (1) and non-completion

as the maximum score (2). The independent variables were coded in a similar manner with a score of (1) reflecting female, access to technology and employment. A score of (2) indicates male, no access to technology and non-employment.

Correlation analysis was conducted to identify the relationships that exist between the independent and dependent variables. Logistic regression was used to predict the outcome of student completion of E-courses based on the student attributes described by the independent variables. Analysis of variance (ANOVA) was computed in order to determine the significant difference between the means and evaluate the power of the test. In order to determine a level of statistical significance a confidence interval was established at the .01 alpha level.

Descriptive Data

The database for this study consisted of demographic data obtained on N= 3453 students. Demographic data included age, gender, GPA, student major and final grade in the course. A total of 196 different courses were surveyed including courses offered through the College of Business, the College of Education, the College of Liberal Arts, the College of Science, the Community and Technical College, the College of Fine Arts and the Graduate College. The study included both undergraduate students and graduate students with no initial distinction made between the two groups.

Data relating to the research questions of access to technology and employment were based on a sample (n=555) randomly selected from the original population. Students were polled through a telephone survey and asked two questions relating to access to technology and employment. The responses of yes and no were entered into the SPSS database and coded as (1) and (2) respectively.

Summary of Findings

From an overall perspective, this research addresses several interesting issues relating student demographics to E-course completion. These results are discussed below.

Q1. What is the relationship, if any, between age and student completion of E-courses at Marshall University?

Studies indicate that the age is a key indicator of successful completion with all forms of distance learning. The successful E-course student is viewed as 28 years or older with some degree of maturity and motivation (Fender, 1999). The data in this study confirms this observation with E-courses offered at Marshall University. Students enrolled in E-courses were determined to be older than the traditional student with a mean age of 27.25. There is a significant relationship between age and E-course completion with a correlation of $r = -.2263$, $p < .01$. The negative correlation factor between the two variables is explained by the negative relationship that as age increases there is more likelihood that the E-course will be completed. Based on the findings of this study age can be described as a predictor of E-course completion as described through the linear relationship expressed through regression analysis. This would imply that at Marshall University, older students are more likely to successfully complete E-courses than the traditional younger student. Regression analysis also is significant indicating a linear relationship between age and course completion. As stated in the research there is a level of maturity associated with older students that is critical for this form of independent learning (Banas & Emory, 1998). The finding substantiates studies conducted by Fender (1999) and Elias (1999), who state that older students tend to value their time, effort and money because they are usually funding their own education and they are anticipating some form of career advancement.

Q2. What is the relationship, if any, between gender and student completion of E-courses at Marshall University?

The ratio of females to males in this study was 51.5% females and 48.5% males. This is relative to the traditional Marshall University student population of 53% females to 47% males. Correlation analysis supports the hypothesis that females are more likely to succeed with online courses ($R = .073$, $p < .01$). This reinforces previous research, which indicates that women are seekers of additional skills and knowledge while attempting to meet family obligations (Thompson & McGrath, 1999). Female learners are also said to be more responsive to online coursework with higher levels of participation and more online discussion. Regression analysis indicates that gender is a predictor of E-course completion as a single variable and in conjunction with the other demographic variables ($R^2 = .0053$, $p < .01$).

Q3. What is the relationship, if any, between GPA and student completion of E-courses at Marshall University?

Data obtained for GPA analysis was contained in a separate file that was coded to ensure confidentiality of the students included in this study. The descriptive data on GPA indicates that the mean GPA for online students is 2.55 as compared to the traditional mean average of 2.57 (Marshall, 2000). Students who enroll in Internet based courses tend to have higher GPAs than traditional students (Sonner, 1999). Previous research conducted by Richards (1992), indicates that 41% of online students had a GPA greater than 2.5. The data presented in this study indicates that GPA is strongly correlated with E-course completion $R = -.44664$, $p < .01$. Persistence with E-courses can be predicted through grade point average, as suggested by the regression analysis conducted in this study. Multiple regression analysis conducted with GPA

and the other student demographic variables of age and gender affirms GPA is a good predictor of successful completion of E-courses.

Q4. What is the relationship, if any, between student's major and student completion of E-courses at Marshall University?

The data provided in this study included 198 different majors of study. In order to compile relevant statistics student major had to be classified into workable categories that could be analyzed and compared to course completion. The categories included in the study were the same categories established as the various colleges at Marshall University. The business category was comprised of majors including accounting, economics and finance. The College of Liberal Arts included areas of journalism, communications and Regents BA. The College of Education incorporates all major areas of study incorporating education at all levels. The College of Science included students majoring in chemistry, biology, and pre-med. The College of Fine Arts was the least represented college and only had a few E-course offerings in the field of theater production, music and art. The Graduate College consisted of all graduate students regardless of major.

Each category of Student Major was correlated with E-course completion to indicate those majors that are better suited for online learning. The categories of student majors with significant correlations included the College of Business, the College of Science and the Graduate College.

Q5. What is the relationship, if any, between access to technology and student completion of E-courses at Marshall University?

The data for this research question was a sample of n=555 students randomly selected from the population of N=3543. The telephone survey required the respondent to answer to the

question of having adequate access to technology in order to complete the course. The respondent was only required to answer yes or no. The ratio of students having computer access was 51.5% to students without adequate computer access at 48.5%. Correlation analysis indicates that computer access is positively correlated with E-course completion $r = .398$, $p = .000$. This supports the argument of the digital divide and the need for computer ownership, which drives Internet education. Studies show that students must have 24-hour access to technology and the computer skills to ensure the technology is in place and the student has the opportunity to succeed.

Q6. What is the relationship, if any, between employment and student completion of E-courses at Marshall University?

The data for this research question was a sample of $n=555$ students randomly selected from the population of $N=3543$. The telephone survey required the respondent to answer to the question if the student was employed while registered for the E-course. The respondent was only required to answer yes or no. The ratio of students employed while registered for the course was 52.4% as compared to non-employed students at 47.6%. Correlation analysis indicates that employment is positively correlated with E-course completion $r = .351$, $p = .000$. Regression analysis indicates that employment is a positive indicator of E-course completion ($r^2 = .123$, $p < .01$). Relative to other student demographic variables of age, gender and GPA, employment is a contributing criterion in predicting E-course completion.

Ancillary Findings

The statistics conducted on the data in this study revealed additional findings not incorporated in the designated research questions. The category of student major was investigated to provide insights to a classification of students that have characteristics that are

considered indicators of student success. The College of Liberal Arts has a degree program that allows students to obtain a degree through college credit and college equivalent credits (CEC) obtained through life and work experiences. The Regents, B.A. is a nontraditional program that is designed for adult students. Typically, the students enrolled in this program are the non-traditional, adult, fully employed students who are in search of a degree that can provide for advancement in their present career situation (Marshall, 2000). These students are viewed as older, more mature and goal oriented. The data on the Regents, BA students were extrapolated from the original data and analyzed as a separate group ($n=302$). Correlation analysis concurred with previous findings that suggest these students are more apt to complete an E-course ($r = -.100$, $p < .01$). Regression analysis of Regents, B.A. with E-course completion was also significant indicating this specific major is a predictor of course success ($r^2 = .01$, $p < .01$). The computations confirmed the previous data analysis indicating that older, employed students are more likely to successfully complete E-courses.

Undergraduate and graduate student differentiation was another finding that was not originally intended as a student demographic variable. Graduate student demographics were extrapolated and analyzed as a separate criterion variable. By virtue of their years in education and the potential for these students to be employed while continuing their education they have the student demographics that are correlated with student success. Graduate students as a separate student major category, were positively correlated with E-course completion ($r = -.064$, $p < .01$) and was also significant as a predictor of E-course completion ($r^2 = .004$, $p < .01$). As with the Regents, B.A. students, graduate students are considered older and employed and therefore, by nature of their student demographics, will be more likely to successfully complete E-courses.

Conclusions

Q1. What is the relationship, if any, between age and student completion of

E-courses at Marshall University?

The data are consistent with the outcome that student age is a key determinant in predicting E-course completion. The findings suggest that older “non-traditional students” tend to be more focused and motivated to complete the course in the designated time frame. As the student population advances from a traditional to a non-traditional student base the issue of age, as a criterion for completion will be more evident. Motivation and self - discipline are necessary for success in any form of independent learning and older students are more likely to exhibit these characteristics. Previous research indicates that motivation and the desire to succeed are functions of student age. Other studies indicate that younger traditional students lack the maturity and orientation to succeed with this form of learning. The University of Phoenix has utilized age as a criterion for student enrollment recognizing that success is more likely with age.

Q2. What is the relationship, if any, between gender and student completion

of E-courses at Marshall University?

The descriptive data suggests that females are more likely than males to enroll in online courses. The data analysis also indicates that females are more likely to successfully complete the course (Bremmer, 1998). The internal orientation of the student is a factor that can lead to success with E-courses. Female students have been shown to be more receptive to individualized forms of learning based on their ideals and their basis for learning. Previous studies have shown that students must be willing to participate and collaborate to be successful

with online courses. Females exhibit traits and skills of communication and interaction that are viewed as necessary for success (Elias, 1999; Thompson & McGrath, 1999).

Q3. What is the relationship, if any, between GPA and student completion of E-courses at Marshall University?

Grade point average (GPA) has been used as a predictor of student success in all forms of learning. Previous research has shown that students with higher GPAs are more likely to start and complete the coursework in any form of learning. GPA can be regarded as a measurement of student performance that can also be utilized in predicting and correlating student outcomes with E-courses. The data in this study replicates previous work in all forms of learning indicating students with higher GPAs are more likely to successfully complete the course. The findings of this study support the claim that GPA can be used as a predictor of successful completion of distance learning programs including E-course programs and may be used as a criterion in selecting students who will complete the course.

Q4. What is the relationship, if any, between student's major and student completion of E-courses at Marshall University?

The data relative to student major and course completion were a strong factor in predicting or correlating E-course completion. Studies indicate that certain courses are not designed for online transmission. The data in this study indicates that student's major, as characterized by the student major categories, was a significant factor in determining student success. Courses offered through the College of Business and the College of Science displayed positive correlation with course completion ($R=.107$, $p<.01$ and $R=-.0967$, $p<.01$). Courses concentrated in the College of Fine Arts, the College of Liberal Arts and the Community and

Technical College would be perceived as requiring some degree of structure and face- to-face interaction found in the traditional based format.

Q5. What is the relationship, if any, between access to technology and Student completion of E-courses at Marshall University?

The results of the data support the theory that students must have computer knowledge and access to the technology to successfully complete an online course. Those students who stated they felt they had adequate access to technology were regarded as successful completers of E-course offerings. These students could maneuver through the course at their own time and leisure, which are necessary factors to ensure completion. Students registering for E-courses are regarded as time and location challenged, relative to attending courses on a physical campus, and require 24-hour access to the technology in order to complete the course. E-courses provide access to education without the need to attend classes on the physical campus. Without an adequate computer and the infrastructure to maintain the technology environment, the student is not able to access the course when it is convenient. This defies the concept of “anywhere,” “anytime,” which is the basis that supports E-courses. In order to succeed with this form of learning students must have access to the computer technology and they must have the ability to utilize the software and the hardware specified by the requirements of the course.

Q6. What is the relationship, if any, between employment and student completion of E-courses at Marshall University?

The results of the data support the supposition that employed students are motivated and have some form of reward that compels them to complete the course. Motivational factors including advancement in their career path or the opportunity for monetary compensation can attribute to higher levels of completion. Studies also indicate that students that are employed are

less likely to procrastinate because of the need to commit to the course early in the semester. Institutions offering online degree programs have reported that successful students are more likely to hold management level positions requiring additional skills and education for success (Bothrun, 1998; Gotschall, 1996). The results of this study replicate the findings of Bothrun (1998) and Walston (1999) who reported that the successful students enrolled in E-courses are the mature, employed students who are compensated internally and/or externally through continuing education.

Ancillary Findings

The basis for this analysis was to indicate student attributes that are correlated and significant as predictors of E-course completion. The research questions did not specify specific student majors or that the attributes of undergraduate and graduate students. Initially the data was compiled to reflect undergraduate and graduate as one pool of students. Further analysis indicated that there were factors in the data that could be extrapolated and analyzed on their own merit. Contained in the College of Liberal Arts is a degree program referred to as the Regents, B.A. degree. This program utilizes previous work and life experiences as some portion of the student's earned credits. Typically the students enrolled in this program are regarded as non-traditional in the aspects of age and employment. These students are viewed as seekers of a degree in order to advance in their present career. When analyzed with E-course completion there was a significant correlation and the student major was also significant as a predictor in regression analysis. This finding substantiates the basis of this study indicating that older, employed students exhibit attributes that are necessary for E-course completion. These are the same student attributes that were confirmed in this study as predictors of E-course completion.

The study also incorporated another finding through analysis of the data. Graduate student data was extrapolated from the original database and was utilized as a single predictor of E-course completion. There was a positive relationship with E-course completion as observed with the correlation and regression studies. This finding is also confirmatory of the original research questions analyzed in this study. Graduate students are recognized to be older and more mature than the traditional undergraduate student. Marshall University's Graduate program is predominately non-residence based, indicating the majority of the students are employed while seeking advanced degrees. These ancillary findings strengthen the basis of this study indicating that the study variables described as specific student attributes are key indicators of E-course completion.

Discussion

The basis for this study was to evaluate E-course completion rates through specific student demographics. The demographics have bearings on student motivation and fortitude in completing college course work in an independent- based learning environment described with online courses. The demographic attributes of age, gender, GPA, student major, access to technology and employment provide a basis for predicting outcomes associated with E-course delivery.

The student demographics of age, gender, GPA and student major were determined to have a direct relationship with E-course completion. This analysis supports previous research that contend education is a social process and that young traditional type learners are better suited to a classroom setting with face to face interaction with the professor and interaction with fellow students (Charp, 1998, Farber, 1999 and Fender 1999). Learners viewed as non-traditional students have the need and desire to succeed with online learning. Student

demographics utilized in this study support the need for differentiation of students to determine which students are better suited for this form of independent learning.

The results of this study support the supposition that completion can be predicted through specific student attributes. This supports the research conducted by Matthews (1999) and Merisotis & Phipps (1999) that investigated E-course completion as a factor determined through specific evaluative criteria. The criteria deemed significant to this study included age, gender, GPA, student major, access to technology and employment.

Age is an evaluative criterion that supports the supposition that older students value and desire a higher education. These students are more mature and have goals and aspirations that coincide with the successful completion of E-courses. This is not to say that younger students do not have the same internal motivations and abilities to succeed but overall as an assigned group, older students (mean=27.25) are more likely to succeed with E-courses.

Gender as a student variable provides many insights in educational studies and was a contributing factor to the findings of this study. Marshall University currently has a ratio of females to males of 53:47, which is typical of institutions similar to Marshall University. The ratio of online students is basically the same 52: 48. This ratio suggests that more female students are utilizing computer technology to attempt coursework. The research in this study also indicates that female students are more likely to complete E-courses than their male counterparts. Studies indicate that women perceive E-courses as a way to meet the challenges of obtaining an education while maintaining family obligations. Female students are said to have a different perspective on E-courses that provides for this level of success. Female students are said to be more responsive to online coursework and are more likely to conduct online discussions. These factors are conducive to an online learning environment and the ability to

succeed. Male students have the ability to succeed with online courses but their perceptions of mass education associated with efficiency and less cost could impact the level of success (Blum, 1999).

Educational research studies rely on the measurement of GPA as a factor in predicting success. Student success with any form of learning is measured through receipt of a final grade inferring student success or failure. The accumulation of these grades constitutes the GPA and is an overall measure of success or failure. Online courses follow the same format of evaluating students with a grade indicating success or failure. The accumulation of previous grades observed through GPA can serve as a predictor of the expected outcome. Correlation analysis ($R = -.447$, $P < .01$) and regression analysis ($R^2 = .200$, $P < .01$) of GPA with course completion indicated that GPA serves as an accurate predictor of E-course completion.

The ability to succeed with online learning requires access to technology and adequate computer skills to meet the requirements of the class. Students register for online courses to overcome the barriers of time and place not realizing the implications of computer technology and the necessary access. Issues of the digital divide and computer ownership relative to E-course completion is a factor that is addressed by all institutions of higher learning offering E-courses (see chapter 2). Completion of E-courses can be difficult without an appropriately equipped computer that is accessible to the student without time or place constraints. Without the proper technology to meet the requirements of the class, students may become frustrated and lose motivation necessary to complete the course (Banas & Emory, 1998).

Employment is another factor to consider when addressing completion of E-courses. Non-traditional students are viewed as older with job commitments that negate a traditional education. In order to pursue a degree students look to distance learning courses to continue

their education while maintaining job responsibilities. These students may experience higher levels of motivation with the prospect of job advancement or tuition reimbursement upon successful completion of the course. Therefore, employment issues in this study are viewed in light of the potential for positive outcomes.

Implications

Education has reached a new frontier through computer technology that has changed the view on the education process. Electronically delivered courses (E-courses) have expanded the boundaries of the college campus providing access to higher education to time and location challenged students. This form of education has been scrutinized as to the level of successful learning and the type of student that can be regarded as successful. The mode of delivery and the self-learning atmosphere requires some investigation to the effects and implications of this form of learning. Access to higher education has always been a major concern that must be addressed to educate the current and upcoming workforce. Online courses provide the access that allows students who are time and location challenged the opportunity to an education. Demographic attributes associated with students can be a contributing factor in determining who will succeed with this technological form of learning. Previous studies describe the distance learner (non-traditional student) as older, female and employed. Other studies that have analyzed other forms of distance learning, including correspondence courses, VCR courses, televised courses and interactive televised courses, have attempted to correlate certain student demographics with completion of these courses.

The basis for this study was to evaluate student demographics as predictor variables and establish a relationship with the dependent variable of E-course completion. Through this analysis the key factors of predicting successful completion, (a grade of D or better), can be

utilized by higher education administrators as a form of monitoring and limiting enrollment to dissuade those students who may be at risk of failure, based on the nature of the student demographics.

E-course offerings continue to prevail in higher education regardless of the claims and innuendoes that discount their value. Many higher education institutions, desiring to remain competitive and capture a growing a market share for students, will utilize this form or learning as a basis for survival. On the other hand, Enrollment specialists are concerned with the rate of students who enroll in these courses and ultimately face failure for a variety of reasons. The completion rate associated with these courses has been evaluated and this form of delivery has been questioned as to quality and effectiveness. Accreditation of the institution can be impacted by E-courses, if there is a question of the quality associated with this delivery system that ultimately impacts student completion rates. Legislators and other governmental policy-makers, who base funding and resource allocation decisions on enrollment and student retention rates, view E-courses with an air of skepticism. These officials are concerned with retention rates and how these rates relate to distribution of federal funds to state and private institutions. Assessment of the education process in terms of cost and access is an issue that continues to be analyzed and debated relative to governmental funding.

The findings of this study revealed student attributes that are significantly correlated with E-course completion that can be utilized as predictors of completion. These findings suggest that higher education administrators, enrollment specialists, deans and faculty members must be aware of the constraints associated with E-courses and address these issues when developing and administering E-courses. E-courses should be monitored through completion rates and evaluated based on factors that have been addressed in this study. E-courses that do not appear suitable for

electronic delivery should be analyzed and restructured if possible to allow for a more effective means of delivery.

Students should also be evaluated to determine the type of student that is capable of achieving success. Those students that are in danger of failure based on the discussed student attributes should be monitored and advised on a continuous basis. If failure is eminent, students should be cautioned not to take E-courses or constraints should be in place that prohibits these students from registering for this type of course.

Regardless of the methodology, E-courses provide a means of distance learning to non-traditional students desiring to continue their education. The effectiveness of this type of education can be evaluated based on completion rates that can be maximized through careful monitoring of the type of students permitted to register for this type of distance learning.

Limitations and Recommendations for Further Research

Limitations of this Research

The major limitations within this research circumvent the nature of the data and the makeup of the sample ultimately utilized in this study. The largest single limitation of the study was the generalization of the data collected from one university. Confidence in any research study can be achieved through replication. In the absence of a broader base of data, a large sample size may extend some degree of generalization. Kerlinger (1986), states that inferences can be made from a selected sample to a general population given an adequate sample size. Replication of this study at other institutions offering E-courses is recommended to further investigate E-course offerings and student completion rates. Any future studies should attempt to draw data from a varied sample of institutions that would be willing to provide such data.

This would provide a larger more varied database increasing the generalization required in a one shot case study (Campbell & Stanley, 1963).

Distance learning has been a prevailing method of delivering education throughout history. E-courses are a method of distance education delivery that has been developed through computer technology and is being used as a means of delivery by educational institutions across the world. This study has provided data that adds to the body of knowledge investigating the implications of E-courses to higher education institutions. However, the influence of E-courses as an acceptable delivery system that provides students with the body of knowledge obtained through a traditional based course has not been studied enough to ensure firm conclusions.

Suggestions for Future Research

This study investigated how student variables can be used to predict E-course completion. Aside from the results discussed within this research, there are other issues that raised some questions that can be addressed in future research. The following discussion addresses those areas that should be investigated in future research efforts.

Though student major was used as a variable in predicting E-course completion, the number of courses taken in the major is another area that warrants additional investigation. A principles level course that is necessary to build fundamental concepts to continue in the student's major may not be suited to E-course format. On the other hand some principle level courses are basic and easily communicated through online delivery with the upper level courses proving to be more difficult. Further studies in course completion could analyze the type and the level of the course being offered as an E-course.

E-courses are classified as a form of distance learning for the non-traditional student, but some degree programs require all students to take an on-line course to fulfill graduation

requirements. Mandatory E-courses should be evaluated to determine if satisfying a prescribed requirement ultimately impacts E-course completion rates. Another factor relative to E-course completion rates could evaluate the type of student on line. A comparison of transient students to traditional students could provide additional insights to E-course completion rates. The significance of the study would be the evaluation of transient students who utilize E-courses as means of transferring college credits to as an alternative university, as compared to the traditional on-campus student. Age was utilized as a criterion in predicting E-course completion but another longevity demographic such as the number of hours completed could analyze the student's current status level (freshman, junior, senior or graduate) in determining E-course completion. The number of credit hours earned by the student could serve as a predictor of E-course completion.

Another factor that is useful in analyzing E-course completion rates could be the contribution of faculty through awareness of on-line students and a willing attitude to assist students in this form of learning. Those faculty members that perceive E-courses as a threat or an easy way out for the student may be less motivated to communicate and assist the student in achieving E-course completion.

Issues of age, gender and employment were explored in this study, but other demographics could be analyzed in determining successful completion of E-courses. Marital status and family obligations could also serve as determinants of course completion. These factors became evident while researching the demographics of age and gender.

Several students included in this study were located in remote sites including Anchorage Alaska. The factor of student location, in reference to the institution offering the E-course, should be considered in future studies. If the student is living in close proximity to the

institution there is the option to withdraw or receive a failing grade and attempt the course in the traditional method on the physical campus. For those students who are not located in the vicinity of the institution the option to attend a physical campus does not exist. This could be a contributing factor in determining success rates and should be considered in future studies.

It is also important to note that with time, the student population will become dominated by students who have been exposed and educated to computer technology and are more apt to succeed with the fundamentals of an on-line course. It would be interesting to conduct this study in five years to assess if these factors are the basis for completion and if access to technology accounts for a stronger correlation.

A final recommendation for future studies, investigating E-course completion rates, requires an analysis of the economic impact of E-courses relative to the student. The cost to the student in terms of lost opportunities and the associated benefits of on-line learning should be analyzed and evaluated to determine the true economic impact of E-courses with respect to the student and the associated completion rates.

To summarize, there is a need for additional studies that center on student and faculty demographics that were not presented as independent variables in this study. These factors may prove to be beneficial in determining the factors that lead to E-course completion. This research joins a number of existing research studies that address the issue of distance learning and E-courses as a form of distance learning. Other studies have addressed factors of validity and reliability, but have not accessed student completion rates relative to student demographics. Thus, the literature has not resolved the issue of completion rates and what leads to student success. There are contingency factors that exist within these studies that can provide additional insights into student success with this form of learning. These factors and the factors discussed

should be investigated to determine student success with E-courses and the role the institution should play in promoting success.

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Appendix A

E-Courses

Offered at Marshall University

<u>Course Number</u>	<u>Course Description</u>
AAT113E	Keyboarding I
ACT318E	Cost Accounting I
AH151E	Medical Terminology
ART407/507	Tribal Art History
ATE480	Social Ethics and Technology
ATE580	SpTp: Adv Com Appl Train Devel
BH250	Basic Humanities
BIC620	Human Biochemistry
BIC720	Human Biochemistry
BSC120	Principles of Biology I
BSC121	Principles of Biology II
BSC250	Microbiology
BSC418/518	Mycology
BSC480	SpTp: Introductory Immunology
BUS101E	Introduction to Business
BUS102E	Basic Economics
BUS104E	Records Management
BUS130E	Fundamentals of Marketing
BUS141E	Real Estate Principles and Practice
CHM203E	General Chemistry I
CHM211	Principles of Chemistry I
CI342	Literature and Language Arts Methods
CI415/515	Integrated Methods and Materials: Secondary Ed
CI501	Middle School Curriculum
CI503	Methods and Materials MCE
CI520	Introduction to Exceptional Children
CI535	General Special Education Programming
CI550	Teaching Writing k-12
CI562	Beginning Educators: Leaders for Tomorrow
CI563	Multiculturalism
CI580	SpTp: Diversity through Children's Literature
CI609	Curriculum of Modern Elementary School
CI613	Children's Literature
CI621	Current Issues and Problems in Reading
CI624	Advanced Instructional Strategies
CI634	Language and Cognition in Early Childhood
CI641	Portfolio Development

<u>Course Number</u>	<u>Course Description</u>
CI654	Identification and Correction of Reading Difficulties
CI657	Advanced Techniques in Teaching Elementary Math
CI659	Final Symposium
CI672	Practicum in Middle School Education
CI675	Curriculum Theory
CI680	Symposium II
CIEC530	Computer Software and Methodology in Education
CIEC534	Applications Software in the Classroom Curriculum
CIEC562	Using the World Wide Web in the K-12 Classroom
CIME555	Technical Mathematics for Math Educators
CIME556	Finite Mathematics for Math Educators
CIME557	Precalculus for Math Educators
CIME558	Geometry for Math Educators
CIME575	Supervised Field Practicum/Seminar in Mathematics
CIEC580	Integrating the Internet into the Curriculum
CIEC583	Instructional Design Seminar
CIEC600	Computing and Instructional Design
CIEC610	Local Area Networks and Telecom in the school
CI613	Reading Methods with Children's Literature
CIRG561	K-12 Reading Instruction with the Internet
CIRG636	Modern Developmental Reading
CIRG644	Content Reading
CIRG708	History and Philosophy of Reading
CIRG709	Reading Field Experience
CISCO131	Networking Academy Program 1 st Year
CISE571	Developing Thematic
CISE572	Environmental Inquiry
CISE574	Integrated Science for the Elementary School
CISE580	Elementary Science
CISL550	Second Language Acquisition
CISL551	Linguistics for ESL
CISL552	Intercultural Communication
CISP535	General Special Education Programming
CISP560	Positive Behavior Support in Schools
CIVI500	Introduction to Visual Impairment
CIVI501	Braille Reading and Writing
CIVI502	Structure and Function of the Human Eye
CIVI503	Instructional Strategy for Teaching Students with VI
CIVI504	Instructional Strategy for Students with Visual Imp7
CL200	Building English Vocabulary
CL230	Greek and Roman Epic
CL231	Women in Greek and Roman Literature
CL233	Greek and Roman Historians

<u>Course Number</u>	<u>Course Description</u>
CL319	Classical Mythology
CLS200	Clinical Biochemistry
CLS468	Clinical Lab Research
CM255T	Intro to Computer Mediated Communication
COM094E	Developmental Communication
COM095E	Developmental Writing
COM111E	Communication I
COM112E	Communication II
COM221E	Business Correspondence and Report Writing
COM231E	Technical Report Writing
COM235	Phi Theta Kappa Leadership Developmental Studies
COUN583	Fundamentals of Counselor Supervision
COUN601	Counselor in Consulting Roles
COUN602	Human Development and Adjustment
COUN603	Counseling Theories
COUN605	Theory and Practice of Human Appraisal
COUN606	Career and Lifestyle Development
COUN617	Counseling Athletes
COUN632	Introduction to Marriage, Couple and Family
COUN670	Interventions for Current Issues School Counseling
COUN672	Organization and Admin of School Counseling
COUN691	Internship
COUN698	Internship: School Counseling
CSD101E	Computers and Data Processing
CSD280	Visual Basic Concepts
CT107E	Internet Fundamentals.
CT108E	Conducting Business on the Internet
CT109E	Research on the Internet
CT212E	Publishing on the Internet
CT240	Internet Data Communications
CT283	Special Topics
CULS610	Appalachian Archaeology
CULS620	Women, Men and Cultural Change
ECN253	Principles of Macroeconomics
ECN420E	International Economics
ED519	Human Growth and Development
ED621	Educational Research and Writing
EDF475	Schools in a Diverse Society
EDF502	Psychology of the Middle Childhood Student
EDF513	Human Growth and Development Birth-8
EDF537	Clinical Experience I
EDF560	Philosophy of Education
EDF565	The Sociology of American Schools

<u>Course Number</u>	<u>Course Description</u>
EDF610	Trends and Issues in Education
EDF612	Educational Evaluations
EDF616	Advanced Studies in Human Development
EDF619E	Advanced Educational Psychology
EDF621	Educational Research and Writing
EDF637	Clinical Experience II
EG107	Engineering Computations
ELCE434	Data Communications
ENG101	English Composition
ENG102	English Composition II
ENG340	African American Literature
ENG408	Advanced Expository Writing
ENG478	Introduction to Socio-linguistics
ENG428/528	International Literature
ENG475	Introduction to Linguistics
ENGR620	Computer Applications
FCS431	Guiding Young Children
FIN201E	Personal Finance
FIN323E	Principles of Business Finance
FIN325E	Commercial Banking
FIN330E	Real Estate Finance
FIN440E	International Finance
FRN102	Elementary French II
GER101	Elementary German I
GER102	Elementary German II
GER203	Intermediate German I
HON395	Community, Society and Cyberspace
HON480	SpTp: Myths, Think, People
HST103E	20 th Century World
HST230E	American History to 1877
HST333	American Colonial History
HST342E	American Legal History
HUMN560	Slavery in America: Examining Recent Research
HUMN601	Literacy Theory and Criticism
HUMN604	Expository Writing for Research
HUMN605	Western Traditions and Contemporary Cultures
IDM777	Neuroscience
IS500	Structured Programming I
IS510	Computer Systems and Structured Programming II
IS600	Management Information Systems
IS605	Systems Analysis
IS610	System Design
IS615	Computer Simulation

<u>Course Number</u>	<u>Course Description</u>
IS620	Introduction to Operating Systems
IS621	Information Structures I
IS622	Information Structures II
IS623	Database Management
IS650	SpTp: Software Engineering
IS656	Business Data Communications
IS699	Final Project
IS799	Final Projects
ISC280	SpTp: Evolution
ISC281	Science and the Visual Arts
IST101	Fundamentals of Communication
IST112	Chemistry in the Environment
IST120	Connections I
IST160	Instrumentation I
IST201	Advanced Communications
IST211	Issues in Modern Production
IST220	Connections II
IST241	Intro to DNA Cloning
IST260	Instrumentation II
IST280	Programming Practicum w/C++
IST283	SpTp: BioSciences
IST430	Electronic Commerce
IST433	Network Communications
IST443	Industrial Biotechnology
IST481	Database Systems
IST482	CISCO Semester Six
IST483	DNA Forensics
IST485	IST Independent Study
IT101	Fundamentals of Computer Technology
IT107E	Fundamentals of the Internet
IT120	Operating Systems Administration
IT150	Application to Spreadsheets
IT240	Internet Data Communications
IT250	Application to Database
ITL415	Reference and Bibliography
JMC385	Advertising Media Planning
JMC602	Mass Communications Research and Methodology
LAT204	Intermediate Latin
LAT404	Roman Elegy: Prop & Tib
LE691	Legal Environment-MBA
LITS510	Modern Poetry
LITS600	Contemporary Irish Fiction
LS500	Educational Organization: Change/Leadership

<u>Course Number</u>	<u>Course Description</u>
LS506	Planning, Research and Eval for School Leaders
LS510	Principalship
LS512	Curriculum Leadership
LS515	Instructional Leadership
LS520	Admin of Elem., Middle, and Sec. Schools
LS530	Human Relations Skills for Leaders
LS535	Technology in Education
LS550	Schools as Systems
LS600	Staff Personnel – Administration
LS610	Leadership for School Improvement
LS625	Human Resources in Public Sector
LS630	The School and the Community
LS645	Community Relations in the Public Sector
LS650	Internship: School Management
LS675	Law and Policy
LS691	The Attendance Director
LS692	School Social Services Internship
LS710	Principles of Leadership
LS714	Administration and Organization of Higher Ed
LS715	Higher Education Administration
LS718	History of American Higher Education
LS719	Introduction to Doctoral Studies
LS725	Higher Education Finance
LS730	Educational Facility Planning
LS740	Public School Law
LS745	Higher Education Law
LS756	Current Issues in Higher Education
LS762	Politics of Higher Education
LS775	Women in Leadership
MAT096E	Developmental Mathematics
MAT097E	Developmental Algebra
MAT098E	Developmental Geometry
MAT115E	Business Math I
MAT116E	Business Mathematics
MAT145E	Technical Mathematics I
MAT146E	Technical Mathematics II
MAT150E	Applied Professional Mathematics
MGT218E	Business Statistics
MGT320E	Principles of Management
MGT420E	Operations Management
MGT423	Managing Change
MGT504	Management Information Systems
MGT672	Theories of Management

<u>Course Number</u>	<u>Course Description</u>
MIS209E	Visual Basic II
MIS290E	Principles of Management Information Systems
MIS310E	Business System Analysis and Design
MIS340E	Database Management
MIS441	Strategic Management Information Systems
MIS678	Graduate Management Information Systems
MKT340E	Principles of Marketing
MKT371E	International Marketing
MKT442E	Market Research
MTH121	College Algebra with Applications
MTH123	Selected Topics in College Algebra
NUR101	Principles of Nursing
NUR409	Nursing Research
NUR421E	Community Nursing
NUR604	Leadership in Nursing
NUR608E	Issues in Health Care
NUR642E	Organizational Dynamics
NUR644E	Financial Management Issues Relevant to Nursing
NUR646E	Nursing MGT in Health Care Settings I
NUR648E	Nursing MGT in Health Care Settings II
OT151E	Medical Terminology
PE118	Electronic Reserve
PE643	Sport in Social Process
PE696	Sport Marketing
PHY101	Conceptual Physics
PHY101L	Conceptual Physics Lab
PHY201	General Physics
PHY202	General Physics Lab
PHY203	General Physics II
PHY204	General Physics Lab
PHY211	Principles of Physics I
PHY213	Principles of Physics II
PHY308	Thermal Physics
PHY330	Mechanics
PHY445	Mathematical Methods of Physics
PS109	Physical Sciences
PSY201E	General Psychology
PSY223	Elementary Behavioral Statistics
PSY406	Psychometrics
PSY417/517	Intermediate Behavioral Statistics
PSY426/526	Cross Cultural Psychology
PSY440E	Physiological Psychology
PSY506	Psychometrics

<u>Course Number</u>	<u>Course Description</u>
PSY508	Abnormal Psychology
PSY610	Assessment of Adults
PSY611	Psychological Assessment of Children
PSY620	Assessment of Adults Practicum
PSY621	Psychological Assessment of Children Practicum
PSY674	Biological Basis of Behavior
PSY745	Internship in School Psychology
REA138E	Academic Skills Review
RDNG600	Symposium in Reading
RST283	Beliefs and Believers
RST450/550	Sociology of Religion
SCI101E	Unified Principles of Biology
SOC200	Introductory Sociology
SOC300	Social Organization
SOC375	Social Stratification
SOC425	Race and Ethnicity
SOC432	Sociology of Appalachia
SOC450/550	Sociology of Religion
SOC455/555	Sociology of Sex and Gender
SOC525	Race and Ethnic Relations
SOC498/598	Death: Personal Understanding
SOC655	Feminist Social Theory
SPN101	Mosaicos: Spanish as a World Language
SPSY616	Advanced Developmental Psychology
SPSY622	Assessment of Children
SPSY745	Internship in School Psychology
TM650	Health Informatics
TM660	Computing and Information Systems Technologies
YGS161	Seminar in Communication and Computers

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CAREER OBJECTIVE

Financial Education Administration and Management

EDUCATION

Ed.D., Higher Education Administration, West Virginia University, Morgantown, WV, May, 2001

Dissertation: "Student Variables as a Predictor of E-Course Completion"

MS, Safety Technology, Marshall University, Huntington, WV, July, 1997

MBA, Marshall University, Huntington, WV, August, 1995

BS, Medical Technology, University of Kentucky, Lexington, KY, May, 1981

PROFESSIONAL EXPERIENCE

CSX Transportation, Huntington, WV

2000-Present:

- Financial Manager for the Central Region.

Marshall University, Huntington, WV

1994-2000:

- Instructor, Division of Finance and Economics, Lewis College of Business
- Instructor, Division of Accounting, Marshall Community and Technical College
- Graduate Assistant, The Research and Economic Development Center
Budgeting and tracking finances for federal grants
- H.E.L.P Program, tutor for learning disabled. Tutoring calculus, statistics, finance, accounting and management, marketing, principles of economics and global macroeconomics
- Graduate Assistant, Division of Management and Marketing, Lewis College of Business.
Research in various management areas, statistical analysis, taught problem solving sessions and labs in statistics utilizing Excel and assisted in grading student work.

St. Mary's Hospital, Huntington, WV

1982-2000: Medical Technologist. Testing of specimens and accurate reporting of findings to physicians, assisted in the setup of Marshall University's clinical hematology program in 1993.

1997-2000: Chairman of Hazardous Materials Program. Maintaining material safety data sheets for the hospital and establishing a data base to update and continue the program to meet JCAHO standards.

1996-1997: Safety Specialist Internship. Prepared a complete chemical inventory and database, prepared testing materials for laboratory personnel, and inspected for OSHA violations.

Dr. Joseph Farrell, Medical Practice, Huntington, WV

1981-1982: Laboratory Manager.

Testing and reporting laboratory results. Maintaining all inventory levels.

TRAINING AND EXPERIENCE

Continuing Education Units in Safety (Workers Compensation, Safety Programs, OSHA Regulations)

Completed course work necessary for the CPA examination (will sit for the exam November 2000)

A strong background in a variety of computer software (SPSS, SAS, Lotus, WordPerfect, Excel, et al.)
College of American Pathologists Laboratory Inspector in Hematology and Safety

HONORS AND ACTIVITIES

Academy of Financial Services
American Society of Safety Engineers
American Society for Healthcare Engineering
American Society of Clinical Pathologists
Ashland Foundation Award for Outstanding MBA Student
Board of Directors of the American Red Cross
Dean's Honor Society
Dean's List
Graduate Assistant, Management/Marketing
International Who's Who of Professional & Business Women
MBA Association
Midwest Business Administration Association
University of Kentucky Honors Program
Who's Who Among America's Teachers
World Safety Organization Certified Safety Manager
World Safety Organization Conference Chairman for Waco Conference 2000

RESEARCH/PUBLICATIONS/PRESENTATIONS

The Latex Protein and its Role in Contact and Allergic Dermatitis. World Safety Organization, Las Vegas, NV. Conference Proceedings, September 1999.

Cryptosporidium: The Hidden Germ. World Safety Organization, Dallas, TX. Conference Proceedings, September 1998.

Healthcare Reform: An Issue or An Answer. Management Conference, Cancun, Mexico. Conference Presentation, Summer 1997.

The Economics of a Hospital Laboratory. Midwest Business and Economics, Chicago, IL. Conference Proceedings, March 1999.

An Effective Means of Teaching Healthcare Finance. Midwest Business and Economics, Chicago, IL. Conference Proceeding, March 1999.

Relationships Between Perceived Student's Attitude and Teaching Evaluations. Journal of Management Education. Forthcoming, 2000.

E-Courses, On-line or Out of Line: A Case Study on Distance Education and the Internet. Association of Financial Analysts Conference. Orlando, FL. Conference Presentation. October 1999.

Teaching with Case Studies. Midwest Business and Economics, Chicago, IL. Conference Presentation, March 2000

Islamic Economic System and its Effect on Entrepreneurship. Midwest Business and Economics, Chicago, IL. Conference Presentation, March 2000