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Community College Student Success in Online Versus Equivalent Face-to-Face Courses

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Community College Student Success in Online Versus Equivalent Face-to-Face Courses

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ABSTRACT

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As part of a nationwide effort to increase the postsecondary educational attainment levels of citizens, colleges and universities have expanded offerings of courses and programs to more effectively meet the needs of students. Online courses offer convenience and flexibility that traditional face-to-face classes do not. These features appeal to students with family and work responsibilities that typically make attending classes on campus difficult. However, many of the students who tend to take courses in this instructional format have characteristics that place them at high-risk for academic failure. Because of the traditional mission of community colleges, they generally serve more students who fit this high-risk profile.

The purpose of this study was to determine if significant differences existed in student success at the community college level in online courses as compared to face-to-face courses. In addition, the researcher investigated the relationship between selected demographic, academic, enrollment, and external environmental factors and student success in online courses. Success was demonstrated by the final course letter grades earned by students. The identification of factors associated with student success in distance education could help improve online course development, evaluation, instruction, student advisement, and support services.

The study involved secondary data analysis of quantitative data relevant to students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester from fall 2012 through spring 2015 (excluding summer sessions). The target population included 4,604 students enrolled at a public 2-year community college located in southern Middle Tennessee.

Results indicated there was a significant difference in success between students taking a course online and students taking a course face-to-face. Also, there was a significant difference in success based on instructional method when the following factors were considered: age group, gender, composite ACT score, student load, student classification, Pell Grant eligibility status, and marital status. There was no significant difference in success based on instructional method when first-generation college student status or dependent child status were considered.

DEDICATION

This dissertation is dedicated to members of my family who had a special influence on me as I pursued a lifetime goal of earning a doctoral degree—my husband Scott Gregory, my sons Brett and Taylor Gregory, my mother Sue Buchanan, and my late father Tom Buchanan. Accomplishing an endeavor such as this takes so much time, effort, and dedication that it affects more individuals than just the person going through the process. I realize that as I attempted to reach my hopes and dreams I often sought patience, support, encouragement, and understanding from others. Also, I was sometimes forced to put study, research, and writing over family time. Hopefully, I have made my family proud and showed that it is never too late to achieve personal goals.

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CHAPTER 1

INTRODUCTION

The United States has historically been considered a world leader in higher education. In 1990 the country ranked number one in the world in the percentage of 25 to 34-year-olds who had earned 4-year degrees (The White House, n.d.). Over the past 25 years the United States has dropped from a 1st to 12th place ranking. Government leaders at both the federal and state levels are taking action to help the country reclaim its number-one ranking in the educational attainment of citizens with efforts to make postsecondary education more attainable and affordable, to strengthen and support community colleges, and to improve accountability at higher education institutions.

Tennessee is helping to lead the government efforts relevant to higher education at the state level. Governor Bill Haslam was influential in passage of the Complete College Tennessee Act of 2010, a plan designed to increase educational attainment within the state. The act includes a performance-based funding formula that emphasizes outcomes instead of enrollment, the factor previously used to determine institutional funding (Tennessee Higher Education Commission [THEC], 2011). In addition, Haslam proposed the Drive to 55 initiative to set a state-specific goal—to increase the percentage of Tennesseans with earned college degrees (associate's or higher) from the current 32% to 55% by the year 2025 (Haslam, 2013). A primary means for reaching the state's educational attainment goal includes the Tennessee Promise, a program that offers in-state high school graduates 2 years tuition-free at a community college or technical college (Drive to 55 Alliance, 2014).

Colleges and universities have contributed to the efforts of government officials by developing programs and services to better fit the increasingly diverse needs of students and to

ensure their success. One way that institutions have increased student access to higher education is through distance learning. The National Center for Education Statistics, or NCES, (2014b) defines distance education as "education that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor synchronously or asynchronously" (p. 1). This type of education consists primarily of online courses and hybrid, or blended, courses. In online courses the majority of the course content is delivered over the Internet. Hybrid courses have a mixture of online and face-to-face delivery of content and typically require some class meetings on campus (Allen & Seaman, 2015).

The convenience and flexibility offered by distance education has made it attractive to students in rural geographic locations and those with work and family responsibilities that make attending school difficult (Allen & Seaman, 2015; Hachey, Conway, & Wladis, 2013; NCES, 2014b; Radford, 2011; Wojciechowski & Palmer, 2005). Postsecondary student enrollment in online education has increased at a rate far exceeding the overall higher education enrollment (Allen & Seaman, 2015). The NCES's Integrated Postsecondary Education Data System (IPEDS), which bases its studies on data from all higher education institutions instead of survey samples, reported that 70.7% of public, degree-granting institutions participate in some level of distance education offerings. NCES data also indicated that distance education participation has been highest at public 2-year colleges (Allen & Seaman, 2015; Radford, 2011).

The role of a community college, as a public 2-year college is typically called, is different from that of a university (American Association of Community Colleges [AACC], n.d.-b; Provasnik & Planty, 2008). Most community colleges award associate's degrees, certificates, and credit for courses designed to transfer to a 4-year postsecondary institution. They provide

workforce development and specialized training to assist area employers. In addition, most offer noncredit courses, cultural activities, and enrichment programs as a service to members of the community. The majority of these institutions have open admissions policies whereby they allow any individual with a high school diploma or General Education Diploma (GED) to enroll as a student and register for classes. Also, the tuition at these colleges is much less than that at a university. All of these factors combine to make community colleges attractive to a wide range of individuals, particularly minority, low-income, nontraditional-aged, and academically underprepared students (AACC, n.d.-b; Provasnik & Planty, 2008).

As student enrollment increased at many community colleges over the past decade, institutions expanded course offerings to meet the demand for more class sections. Some institutions had outgrown their existing classroom space and had to determine effective ways to manage the problem without new building construction (Hachey et al., 2013). One of the core missions of community colleges has always been to provide access to education for students with a wide range of needs. The fact that the 2-year schools have been leaders in distance education participation seems logical, given that the offering of online courses and programs is a relatively inexpensive way to expand access and serve students with diverse needs (Hachey et al., 2013).

Additional NCES data showed the majority of students taking distance education courses were 24-years-old or older, employed full-time, and either married or with dependent children (Radford, 2011). Traditional-aged college students are 18 to 24-years-old, and nontraditional students, or adult learners, are generally considered those 25-years-old and older (Compton, Cox, & Laanan, 2006; Wyatt, 2011). Although they tend to be more serious, focused, and mature than traditional students, adult learners face challenges as they attempt college. Because they have often been out of school awhile, they are often underprepared for collegiate-level work. Also,

their personal lives may require so much time and energy that they have insufficient time to study. Consequently, the dropout rate is higher for nontraditional students than for traditional students (Compton et al., 2006).

Although the flexibility offered by online classes potentially allows adult learners the chance to pursue an education while fulfilling outside commitments, its structure may also be a barrier to student success (Capra, 2011). The nature of online courses is such that students are often forced to think critically, take active roles in their learning experiences, and be more self-motivated, independent, self-disciplined, and goal-oriented (Kerr, Rynearson, & Kerr, 2006; Wojciechowski & Palmer, 2005). Also, not only must students learn new content, they must become familiar with the technology required to navigate and participate in the course. Many students have issues with the technology, time management, and feelings of isolation as a result of not assessing their fit for this course format prior to enrolling (Aragon & Johnson, 2008; Capra, 2011; Wojciechowski & Palmer, 2005).

Colleges and universities report that attrition rates are much higher in distance education than with traditional courses (Allen & Seaman, 2015; Aragon & Johnson, 2008; Hachey et al., 2013; Harrell & Bower, 2011; Wojciechowski & Palmer, 2005). Administrators tend to agree that institutions have a more difficult time retaining distance education students, but they are unsure whether the cause is the nature of the course, the characteristics of the students enrolled, or a combination of both factors (Allen & Seaman, 2015). Perhaps the statistics signify "the online environment is not suitable for all students" (Wojciechowski & Palmer, 2005, para. 5).

Statement of the Problem

As the United States strives to increase the educational attainment levels of its citizens, institutions of higher education are under pressure to increase student access, meet diverse

student needs, and ensure student success like never before. Colleges and universities have increased the number of students they can serve with distance education programs and courses. Although online courses are popular, primarily because of the convenience and flexibility they offer, the students who tend to enroll in them have characteristics or circumstances that put them at high-risk for academic failure (i.e., dropping classes, failing classes, and/or withdrawing from school).

The purpose of this quantitative study was to determine if significant differences existed in overall student success at the community college level in online courses as compared to in face-to-face courses taught by the same instructor and across disciplines. In addition, the researcher investigated the relationship between each of the following attributes and student success in online courses:

- demographic (age group and gender),
- academic (composite ACT score),
- enrollment (student course load and student classification), and
- external environmental (financial aid status, first-generation college student status, marital status, and dependent children status).

Research Questions

This study involved an analysis of data relevant to demographic, academic, enrollment, and external environmental attributes of students enrolled in online and face-to-face sections of courses taught by the same instructor within the same semester at a community college during a 3-year period. The following questions guided the research:

1. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course

grade between students taking a course online and students taking the same course with the same instructor face-to-face?

2. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between traditional-aged and nontraditional-aged students based on instructional method (online or face-to-face)?

3. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students based on instructional method (online or face-to-face)?

4. Is there a significant difference in the mean composite ACT scores among students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade with regard to instructional method (online or face-to-face)?

5. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time (registered for 12 or more semester hours) and part-time (registered for less than 12 semester hours) students based on instructional method (online or face-to-face)?

6. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores based on instructional method (online or face-to-face)?

7. Is there a significant difference in student success as measured by the proportion of

students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between Pell Grant-eligible students and non-Pell Grant-eligible students based on instructional method (online or face-to-face)?

8. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students based on instructional method (online or face-to-face)?

9. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students based on instructional method (online or face-to-face)?

10. Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children based on instructional method (online or face-to-face)?

Significance of the Study

Institutions of higher education are increasing student access by expanding distance education offerings. Their common goal is increased educational attainment by citizens, which means completion of a degree or certificate. Therefore, colleges and universities must ensure that students are successful in the courses and programs in which they enroll. The NCES (2015) reported that the 2013 national 6-year graduation rate for first-time, full-time freshmen students averaged 59% for students earning a bachelor's degree at a 4-year institution. For 2-year postsecondary institutions, the 2013 national 3-year graduation rate for first-time, full-time

freshmen students earning an associate's degree or certificate averaged 29% (NCES, 2015).

Information from the Tennessee Higher Education Commission (THEC) indicated that the 2014

state 6-year graduation rate for first-time, full-time freshmen averaged 57.5% at the university

level and 28.1% at the community college level (THEC, 2015). These statistics show there is

room for improvement in efforts to have a more educated public. The identification of factors

associated with student success in distance education could help improve online course

development, evaluation, instruction, student advisement, and support services.

Definition of Terms

The following terms are relevant to this study. Their definitions are provided to increase

understanding of content.

Asynchronous delivery: an online course delivery method in which the course materials

are available for access at any time, providing students with the flexibility to complete the course

requirements at their own convenience, although generally by periodic assigned due dates

(Bergfeld, 2014).

Distance education (distance learning):

education in which there is a physical separation of the teacher and learner and when
communication and instruction take place through, or are supported by, any technological
means such as telephone, radio, television, computers, satellite delivery, interactive
video, or any combination of present and future telecommunication technologies.
(Tennessee Board of Regents [TBR], n.d., para. 2)

Face-to-face (f2f) education: traditional educational format in which the instructor

interacts with students in a class that meets on campus (Bergfeld, 2014).

Hybrid (blended) courses: a form of distance education that includes a mixture of face-

to-face and online delivery of content and usually includes some on-campus class meetings

(Allen & Seaman, 2015).

Nontraditional student (adult learner): a student 25-years-old or older who likely (a) delayed attending college for at least a year after high school, (b) maintains full-time employment, (c) is financially independent, (d) has dependent children and/or a spouse, (e) enrolls in school part-time, (f) serves as a single parent, or (g) earned a GED instead of a high school diploma (Compton et al., 2006; Wyatt, 2011).

Open admissions: a policy observed by many community colleges in which any individual who has earned a high school diploma or GED can apply, be admitted, and take courses (Provasnik & Planty, 2008).

Pell Grant: federal funds available primarily to low-income undergraduate college students and are not required to be repaid (U.S. Department of Education, 2015).

Special student for credit: a student who takes college courses for credit but is not seeking to earn a degree or certificate at the institution (Motlow State Community College, 2015).

Synchronous delivery: an online course delivery method in which the students and instructor meet and interact in "real time," using technological methods such as web conferencing (Bergfeld, 2014).

Traditional student: a student 18 through 24-years of age (Wyatt, 2011).

Limitations and Delimitations

Certain limitations exist relevant to the factors investigated in this study. Some of the variables (i.e., race, marital status, first-generation college student status) examined were self-reported by students. ACT score information was not available for some students who were 21-years-old and over. Also, factors not explored in the study may have had an effect on student success. In addition to an analysis of the proportion of students making a letter grade of "A,"

"B," "C," "D," "F," or "W" on final course grades, other options exist to define and measure student success.

The study was delimited to a specific public community college in southern middle Tennessee. Therefore, the findings may not be generalized to other postsecondary institutions. Also, the study was delimited to course sections taught in both online and face-to-face format by the same instructor within the same semester from fall 2012 through spring 2015. Summer school sessions were excluded from the study because student enrollment during those terms typically consists of many transient students whose primary institution is at another postsecondary school. The researcher made the assumption that the course content and primary requirements were the same for both the online and face-to-face formats of each specific course.

Overview of the Study

This study is organized into the following five chapters: (1) Chapter 1, Introduction; (2) Chapter 2, Literature Review; (3) Chapter 3, Research Methodology; (4) Chapter 4, Data Analysis; and (5) Chapter 5, Summary, Conclusions, and Recommendations for Practice and Further Research. Chapter 1 includes background information relevant to the study such as a statement of the problem and its significance. This chapter also contains the research questions, definitions of terms, and limitations and delimitations. Chapter 2 contains a comprehensive review of literature specific to the problem under investigation. Chapter 3 includes information on the design of the study, the population and sample, and data collection methods. Chapter 4 is a presentation of the results of the data analysis. Chapter 5 includes an overview of the study, conclusions as a result of the findings, implications, and recommendations for future research and practice.

CHAPTER 2

LITERATURE REVIEW

Over the past 20 years, higher education institutions have experienced unprecedented demand for and enrollment in distance education, specifically in online courses and programs. Most colleges and universities have embraced technology and see online courses as a cost effective way to better meet the diverse needs of students. In 2014 over 70% of public higher education institutions in the U.S. considered online education critical to their long-term strategic plans (Allen & Seaman, 2015). However, there are concerns that online education may not be as effective as traditional face-to-face education. Many postsecondary institutions have reported higher attrition rates for online students than for traditional students. Also, questions exist concerning the value, legitimacy, and rigor of online learning, and there are differences in its acceptance by employers and the general public (Parker, Lenhart, & Moore, 2011).

Because of circumstances beyond their control; such as family and work responsibilities, distant location of residence, or the presence of physical or mental disabilities; some students see online courses are their only option for participating in higher education (Harrell, 2008). This is especially true at community colleges because they serve more nontraditional and academically at-risk students than 4-year universities (Coley, 2000).

As postsecondary institutions increase efforts to improve educational attainment rates, an examination of all programs and services is necessary. The fact that distance education has expanded to comprise an integral part of the higher education environment makes its study important. Information attained could be used to assist advisors, online course developers and instructors, student support staff, administrators, and students in preparing and participating in distance education successfully.

This literature review is organized into six primary sections. The first section includes a

discussion on the historical development of distance education; the second section is a review of the historical development of community colleges. The third section is an examination of the relationship between distance education and community colleges, and the fourth section describes the differences between online and traditional learning. Earlier research on overall student success in distance education is summarized in the fifth section, and the final section of the literature review includes an analysis of research on factors associated with success in distance education.

Historical Development of Distance Education

Correspondence Courses

The earliest form of instructional delivery considered distance education consisted of correspondence courses through the United States Postal Service in the late 1830s and 1840s (Bower & Hardy, 2004; Casey, 2008; Colorado & Eberle, 2010; Matthews, 1999). An Englishman named Sir Isaac Pitman used handwritten postcards to teach shorthand to secretaries. He would send the students the assignments, and they would return the completed transcriptions for corrections. Upon successful completion of the course, students received a certificate (Casey, 2008).

Anna Eliot Ticknor, a wealthy woman from the Boston area, established the Society to Encourage Studies at Home in 1873 (Bower & Hardy, 2004; Casey, 2008). This program provided the opportunity for women of all class levels to earn an education at home. More than 20 self-paced courses were offered, and each had a prominent, educated woman of the community as its facilitator (Bower & Hardy, 2004).

William Rainey Harper developed a correspondence program that led to the establishment of the Correspondence University in Ithaca, New York, in 1883 (Bower & Hardy,

2004; Casey, 2008). Harper later became the first president of the University of Chicago and is considered the father of distance education. Most historians also consider him as the father of the American junior college because the first college of that type, Joliet Junior College, was founded in Illinois under his influence (American Association of Community Colleges [AACC], n.d.-d; Bower & Hardy, 2004).

Although many of the early correspondence courses and programs targeted female students, the International Correspondence School (ICS) established in Scranton, Pennsylvania, in the 1890s served males (Bower & Hardy, 2004; Casey, 2008). It had its origins in correspondence courses designed for coal miners and developed by a newspaper editor and former miner named Thomas J. Foster. Foster sought to provide miners with the safety skills and engineering knowledge necessary to advance in their profession. Demand from students led to the development of courses for ironworkers and railroad workers (Casey, 2008). Eventually a school was established to serve students from all over the United States as well as in Mexico and Australia (Bower & Hardy, 2004). ICS exists today as Penn Foster, a company that offers a variety of online degrees and certificates.

In 1892 the University of Chicago established the first college-level distance education program (Casey, 2008; Colorado & Eberle, 2010; Matthews, 1999). Students who lived far from campus would exchange assignments with their professors through the mail. However, use of the postal service had its disadvantages, such as delivery costs. Also, sometimes lessons were lost or received late (Bower & Hardy, 2004).

Radio, Television, and Satellite Courses

By the 1920s distance education was being delivered via radio, but the majority of courses offered were not for credit (Casey, 2008). In the 1950s television technology was

developed to the level that it was implemented for distance education. Satellite technology was created in the 1960s and allowed for interactive two-way transmission of courses over great distances, but its cost prohibited widespread use for another 2 decades (Bower & Hardy, 2004).

Technology and distance education advancements were not only occurring in the United States. The British Open University was founded in Great Britain in 1969 and offered complete distance education degree programs (Bower & Hardy, 2004; Casey, 2008; Colorado & Eberle, 2010; Matthews, 1999). Learning materials consisted of audio and video content supplemented with radio and television broadcasts (Matthews, 1999). Today this university is one of the largest in Great Britain and a model of excellence for distance education. In addition, it has expanded to serve students all across the world (Casey, 2008).

In 1970 Coastline Community College in Orange County, California, launched the first completely televised college courses and became the first college without a physical campus (Casey, 2008). Colleges in Florida and Texas soon followed with similar telecourse offerings. The invention of videotape technology in this decade allowed instructors to record class lectures so institutions could offer video courses. Although there was limited teacher-student interaction with these educational formats, enrollments soared in courses and programs (Cohen & Brawer, 2003; Henderson, 2009).

Personal Computers, the Internet, and the World Wide Web

Computers had been in existence prior to the 1970s, but because of their large size, complexity, and expense, scientists and mathematicians were the only individuals who used them (Boettcher & Conrad, 1999). In 1971 the Intel Corporation created the microprocessor, and that invention led to the development of personal computers (Casey, 2008). The first personal computers came as kits that users had to assemble themselves, so the primary purchasers were

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electronic hobbyists (Henderson, 2009). Steve Jobs and Steve Wozniak started the Apple

Computer Company in 1976 with release of the Apple I computer, a kit computer. Sales of that

computer were slow, but a year later they released the Apple II, a fully assembled personal

computer with color graphics and keyboard. Its sleek stylish design for the time made it an

instant success (Henderson, 2009).

By the early 1980s IBM, Radio Shack, Compaq and several other companies had

personal computers on the market, but these were mainly used as business machines because of

cost and the limited availability of software at the time (Henderson, 2009). Apple released the

Macintosh in 1984, a mouse-driven computer. In the late 1980s Microsoft introduced its

Windows operating system that eventually replaced the MS-DOS system previously used. Bill

Gates announced the first version of Microsoft Office in 1988. It was released in 1990 as a

bundled suite of software including Word, Excel, and PowerPoint (Henderson, 2009).

Although computer costs were gradually decreasing and ease of use was increasing,

mainstream computer use by the public was still in the future. Those who did use computers

were frustrated with the fact that there were limited capabilities to connect computers together

for communication and information sharing. The Internet originated with the Advanced

Research Project Agency (ARPA), a research and development agency created under the United

States Department of Defense following the successful launch of the Sputnik 1 satellite by the

Soviet Union in 1957 (Boettcher & Conrad, 1999; World Wide Web Consortium, n.d.). The

primary function of this organization was to support and direct research efforts at universities

across the country to advance the U.S. technologically. In 1969 the first Internet connection,

ARPANET, became fully operational and connected the ARPA main computer to four research

university computers, each located at a geographically distant location (Harasim, 2000). These

computers were located at: (a) the University of California, Los Angeles (UCLA); (b) Stanford Research Institute (SRI), founded by Stanford University; (c) the University of California, Santa Barbara (UCSB); and (d) the University of Utah (Hafner & Lyon, 1998). Shortly thereafter, in 1971, electronic mail (e-mail) technology was developed, allowing for networking between computers (Harasim, 2000). By 1982 technology had advanced to allow different networks to communicate with one another (World Wide Web Consortium, n.d.).

The World Wide Web (WWW or Web) was born in 1991, and its ability to link computers worldwide made information easily accessible for anyone with some basic technology skills and a personal computer (Casey, 2008; Harasim, 2000). Invented by British physicist and computer scientist Tim Berners-Lee, the Web was "a multimedia branch of the Internet" (Hafner & Lyon, 1998, p. 168). It allowed a user to point and click on hyperlinks to navigate from one website to another (Boettcher & Conrad, 1999; Hafner & Lyon, 1998; World Wide Web Consortium, n.d.). The development of the "information superhighway" drastically increased the demand for home computers (Casey, 2008). Throughout the 1990s companies such as Dell and Gateway sold computers online and delivered them to families nationwide, enabling the average citizen to use electronic mail (e-mail) and browse the Internet (Henderson, 2009).

These advancements in computer technology also expanded the options for distance education. Nova Southeastern University in Florida began offering the first online graduate courses in 1985 (Harasim, 2000). The University of Phoenix had specifically targeted working adult students since it was founded in 1976. However, in 1989 it began offering an online degree program to add to its already-convenient and flexible options (Casey, 2008). Jones University in Colorado became the first accredited online-only institution in 1993, and in 1997 Western Governors University (WGU) was incorporated as a private, nonprofit, online university (Casey,

2008; Western Governors University [WGU], n.d.). WGU was unique in that it involved a collaborative effort of 19 governors from the western states of the U.S. Also, its programs were competency based; students progress through courses at their own pace, based on the demonstration of sufficient mastery of subject matter through a variety of assessment types (Bergfeld, 2014; WGU, n.d.).

During the 21st century distance education has continued to grow and expand. The number of students in the United States enrolled in online courses increased 283%, from 1.6 million to 6.1 million, from 2002 to 2010 (Allen & Seaman, 2011). In 2013 over 95% of all public degree-granting institutions offered some form of distance education (Allen & Seaman, 2015). Two-year institutions have consistently been the leaders in the number of online course offerings and the proportion of students enrolled in distance education (Allen & Seaman, 2008; Parker et al., 2011; Parsad & Lewis, 2008; Radford, 2011).

Historical Development of Community Colleges

Establishment of the First Junior College

The origins of community colleges in the United States trace back to 1862 with Congress's passage of the Morrill Act, or Land Grant College Act (AACC, n.d.-d; Cohen & Brawer, 2003; Drury, 2003; Webb, 2006). The act, named for sponsoring Representative Justin Morrill of Vermont, granted land to states specifically for the establishment of agricultural and mechanical schools. Industry leaders, as well as farmers and general laborers, stated existing colleges provided an education that was impractical and irrelevant for the economic needs of society. In 1890 a second Morrill Act was passed to prevent these state-established land-grant institutions from denying admission to students because of race. When the Civil War ended in 1865, a significant number of slaves were set free. Some of the states, particularly in the South,

would not allow them to be admitted to their institutions. The second act stated that federal

funds would be withheld unless "separate but equal" institutions were provided. As a result

many of the historically Black colleges and universities in the United States were established at

this time. Together, the two acts expanded public education to include individuals who had been

previously excluded (AACC, n.d.-d; Cohen & Brawer, 2003; Drury, 2003; Vaughan, 1985;

Webb, 2006).

At the beginning of the 20th century the number of higher education institutions was

escalating (Webb, 2006). Many institutions attained university status by expanding to include an

emphasis on graduate studies and research. Some university leaders remarked that their time and

efforts should be focused on students in the advanced upper-division courses rather than

undergraduates in lower-division general education classes. In addition, they suggested that

some students were not academically prepared to attend universities and should stop their

education after 2 years in a "terminal" postsecondary program (Vaughan, 1985). William

Rainey Harper, president of the University of Chicago, proposed a plan for reorganization

whereby a student would attend junior college for the first 2 years and senior college for the last

2 years. A student would receive an associate's degree upon completion of the first 2 years of

study (Webb, 2006).

Harper was part of a movement to get local high schools to offer the first 2 years of

postsecondary education, a practice in Germany at the time (Drury, 2003). The principal of

Joliet High School, a friend of Harper's, agreed to offer the courses. Based on Harper's ideas

and efforts, in 1901 Joliet Junior College was founded in Illinois and was the first American

public junior college (AACC, n.d.-d; Coley, 2000; Drury, 2003; Webb, 2006).

William Rainey Harper played such an active role in the 2-year college movement that he

is considered the father of the junior college in America (Vaughan, 1985). Under his leadership, a junior college was established at the University of Chicago. Also, he suggested that weak 4-year institutions become junior colleges and drop their upper division courses. Several colleges took Harper's advice and made the change (Vaughan, 1985).

Growth and Expansion of Junior Colleges

The growth and expansion of junior colleges was slow at the beginning of the 20th century. The state of California passed legislation in 1907 that allowed public high schools to offer the first 2 years of postsecondary education (AACC, n.d.-d; Vaughan, 1985). However, it was not until 1910 that any action transpired relevant to the law. In that year Fresno Junior College, a part of Fresno High School, opened with its own high school graduates paying no tuition. In fact, most of the early junior colleges that were established were attached to local high schools. The 2 years of coursework they offered were referred to as the 13th and 14th grades of school. At that time the primary curriculum consisted of liberal arts courses designed for transfer to a university (Drury, 2003; Webb, 2006).

In 1920 the American Association of Junior Colleges (AAJC) was founded. The organization's members were not in agreement as to the mission of a junior college (Drury, 2003). Many members commented that the institutions should provide a general academic education for transfer, but some expressed that it should offer terminal, practical vocational training. Most members agreed that junior colleges did not receive respect from senior colleges and universities (Drury, 2003). In an effort to appear united, in 1922 the AAJC finally released a defining mission statement that junior colleges would offer 2 years of strictly collegiate-level coursework. Several years later it revised the definition to include vocational programs, with the stipulation that general education courses be included (Cohen & Brawer, 2003).

The Great Depression during the 1930s stimulated unprecedented growth in junior college enrollments (Drury, 2003). High school graduates unable to find work turned to school for job training in an effort to increase their future employability. Enrollments dropped during World War II, as many students served in the military. Postwar, with the passage of the Servicemen's Readjustment Act, or G.I. Bill of Rights, by Congress in 1944, veterans received higher education benefits. This act enabled men and women of all ages, races, and socioeconomic levels to attend college in numbers like never before (Altbach, Gumport, & Berdahl, 2011; Drury, 2003; Webb, 2006; Vaughan, 1985).

In 1947 the President's Commission on Higher Education released the Truman Commission Report, in which it recommended that a system of public community-based colleges be established to offer courses and programs for cultural enrichment and continuing education, as well as for undergraduate postsecondary academic education. According to the report these colleges should charge little to no tuition and would provide the classes as a service to citizens who lived in the areas in which they were located (AACC, n.d.-d; Cohen & Brawer, 2003; Drury, 2003; Vaughan, 1985). Although the President's Commission on Higher Education emphasized the importance of community colleges charging no tuition, practically all community colleges established after the release of the report did charge tuition (Cohen & Brawer, 2003).

By the 1960s higher education institutions were seeing an influx of students because of the post-World War II baby boom. Many of these students enrolled in community colleges, triggering such rapid expansion that approximately one new college opened each week somewhere in the country (Altbach et al., 2011; Cohen & Brawer, 2003; Drury, 2003). According to the American Association of Community Colleges (n.d.-a) 457 community colleges opened within that decade. Another factor that contributed to the enrollment increase at

this time was the passage of student aid legislation by the federal government. The Higher Education Act of 1965 provided financial assistance for students to attend colleges and universities. Its purpose was to expand higher education opportunities to individuals from lower socioeconomic levels. The subsequent amendments and reauthorizations to the act have resulted in low-interest loans, grants, and programs that have enabled many students to attend college who would not have been able to otherwise because of financial constraints (AACC, n.d.-d; Vaughan, 1985).

In 1972 the AAJC changed its name to the American Association of Community and Junior Colleges (AACJC) to reflect the fact that most 2-year institutions served their local communities (AACC, n.d.-f). Increasingly community colleges began to emphasize vocational programs, specialized training, and workforce development to help supply local employers with skilled workers. In addition, they continued to offer courses designed for university transfer. These efforts continued into the 1980s, with the colleges providing "open access," or admission to anyone who had earned a high school diploma (Provasnik & Planty, 2008; Vaughan, 1985). The fact that individuals with any level of academic proficiency could take classes meant that the institutions had to expand remedial and developmental education. Too many community college students needed training in basic reading, writing, and arithmetic in order to successfully complete collegiate-level coursework (Cohen & Brawer, 2003).

As the number of students enrolled in community colleges increased in the later part of the 20th century, so did the percentage of part-time students (Cohen & Brawer, 2003). One reason for the enrollment shift was because older working adults were taking classes at nights and on weekends. Also, there was an increase in the number of women attending college while raising children. Some students only wanted to take a few courses for general interest and

personal growth and had no intention of completing a degree (Cohen & Brawer, 2003).

In 1992 the AACJC became the American Association of Community Colleges (AACC, n.d.-f). The group's goal was to promote the role of community colleges in providing open access, charging low tuition, and offering courses and programs in college preparation, workforce development, continuing education, and community service to students of diverse backgrounds. Many community colleges observed that their purpose was consistent with the slogan of a Texas college almost 50 years earlier: "We will teach anyone, anywhere, anything, at any time whenever there are enough people interested in the program to justify its offering" (Cohen & Brawer, 2003, p. 22).

Community Colleges in the 21st Century

The number of community colleges in the United States has steadily increased—from 582 institutions in 1960 to over 1,700 by the year 2000 (NCES, 2014a). In 2014 there were 1,685 community colleges. The recent numbers include branch campus locations that are a part of many community colleges. Enrollment has increased from approximately 600,000 students in 1960 to over 7.5 million students by the year 2010 (Cohen & Brawer, 2003; NCES, 2014a; Vaughan, 1985). According to data from the AACC (n.d.-c) 46% of all undergraduates enrolled in U.S. higher education institutions in fall 2013 attended community colleges.

"Community colleges fill a unique role in American education" (Johnson & Berge, 2012, p. 897). The majority of these institutions continue to have open admissions policies and serve students from all academic, socioeconomic, racial, ethnic, and gender groups at tuition costs much lower than those at a 4-year university (Cohen & Brawer, 2003; Coley, 2000). They function in offering a wide range of courses and programs, including courses designed for university transfer, workforce training, and associate's degree and certificate programs. In

addition, most provide remedial and developmental coursework, career counseling, tutoring, and other support services, as well as lifelong learning opportunities in the form of continuing education and general interest courses (Cohen & Brawer, 2003; Coley, 2000; Johnson & Berge, 2012).

Researchers have identified seven factors that put postsecondary students at risk for noncompletion of their education (Coley, 2000). These include (a) delaying entry into college, (b) enrolling part-time, (c) working full-time, (d) having financial independence, (e) supporting dependent children, (f) serving as a single parent, and (g) lacking a high school diploma. Although studies have shown three fourths of all undergraduate students have at least one risk factor, community college students tend to have multiple risk factors (Coley, 2000). As a result, community college 3-year associate's degree graduation rates are only about 30% (AACC, n.d.-e).

Adult learners, or nontraditional students, comprise a significant proportion of the community college population at many institutions. Typically adult learners are defined as students 25 years old and older (NCES, 2012). They have different characteristics from traditional college students and should be considered separately with respect to programs and services (Wyatt, 2011). Many have at least one of the characteristics that increase the risk they will not complete a postsecondary education. Generally, they consider their roles as students to be secondary to those as employees, parents, or spouses, and they often do not put their coursework as a priority (Compton et al., 2006). Accelerated programs and online courses are particularly popular options because they offer nontraditional students the chance to fit education into their already-busy lives (Compton et al., 2006). Many of these students are academically unprepared, lacking study skills and requiring developmental courses. Approximately 60% of

entering community college students must enroll in remedial courses, in many cases before taking collegiate-level classes (AACC, n.d.-e).

The Relationship Between Distance Education and Community Colleges

In 2014, 97% of public 2-year institutions offered distance education courses, a higher percentage than for any other institutional category (Allen & Seaman, 2015). Approximately 30% of U.S. higher education students are enrolled in at least one online course, and enrollment estimates for 2013 ranged from 5.3 to 7.1 million online students. The majority of these students attend community colleges (Shea & Bidjerano, 2014). The original intent of community colleges was to provide students from diverse backgrounds with a variety of postsecondary education options. As a result of their many roles, these institutions have attempted to effectively serve students with a broad spectrum of needs, knowledge, skills, and life experiences (Johnson & Berge, 2012). In an effort to meet student demand for convenience and flexible scheduling options and to increase student access, community colleges have been leaders in distance education (Hachey et al., 2013; Parsad & Lewis, 2008). However, challenges exist in the developing and maintaining quality and effective online courses and programs for a population that is so diverse (Shea & Bidjerano, 2014).

The financial revenues of community colleges are usually much less than those of universities. Some community colleges have expanded their distance education offerings as a way to deal with simultaneous enrollment increases and budget decreases. Although there are technology infrastructure costs associated with distance education, usually they are substantially less than those related to construction of new classroom facilities (Bower & Hardy, 2004). There are, however, expenses required for technical support staff, online faculty, and course developers to ensure distance education operates effectively. At many community colleges, adjunct faculty

members teach the majority of courses (Cejda, 2010; Provasnik & Planty, 2008). As online

enrollments and course sections increase, institutions must increasingly use these faculty

members to teach online classes. They may not have the knowledge, training, and experience

required to satisfactorily teach distance education courses.

A significant number of students who attend community colleges are nontraditional

students with work and family responsibilities that make attending traditional classes on campus

difficult (Pontes & Pontes, 2012). Some studies have shown that the types of students who

choose to enroll in distance education courses have many of the characteristics of students at risk

for noncompletion (Aragon & Johnson, 2008; Hachey et al., 2013). On the contrary, other

researchers have found that students who take online courses tend to have a stronger academic

preparation than the average community college student (Xu & Jaggars, 2011b).

Differences Between Online Learning and Traditional Learning

Manner of Communication

According to Allen et al. (2004) the development and use of technology in education has

changed the manner in which communication occurs, but it has not changed the primary focus of

education—on students and their learning. In distance education the student and instructor are

physically separated (Bergfeld, 2014). Online courses are categorized as asynchronous or

synchronous, depending on whether or not the instructor and students interact or meet online at

the same time. An asynchronous online course is one that is time-independent. The course

materials are generally posted online for students to access at any time. There are typically

specific due dates for assignments and exams, but there are no class meeting times. Students are

free to complete work at their own convenience, and they submit assignments by designated

deadlines. Communication within an asynchronous course is usually by e-mail or posting on a

discussion board. A synchronous online course is time-dependent. It includes prescheduled

class meeting times at which students and the instructor interact by way of two-way video

conferencing, Internet chat, or some other technological means (Allen et al., 2004; Bergfeld,

2014; Bower & Hardy, 2004). Communication in an online class environment does not normally

allow for level of social interaction and the use of the vocal expressions and nonverbal gestures

that are a part of communication in a traditional, face-to-face classroom. Those limitations cause

frustration for some students (Allen et al., 2004).

Organization and Delivery

Almost all online courses are organized and delivered and using course management

software (CMS), also called learning management system (LMS) software, that enables students

to access course materials, post on discussion boards, submit assignments, send e-mails, take

assessments, and view grades (Bergfeld, 2014). Two of the most commonly used CMS systems

are Blackboard Learn and Brightspace, by Desire2Learn. Many traditional courses now have

elements of online courses incorporated into them, such as the use of course management

systems, so many students are familiar with navigation of the online environment. Although

variations exist in specific requirements from one course to another, knowledge of relatively

basic technological skills is often sufficient for completing an online course. However, students

tend to be more successful in distance education if they frequently use computers, the Internet,

and other forms of technology and are comfortable with it (Dupin-Bryant, 2004; Hachey et al.,

2013; Harrell & Bower, 2011; Kerr et al., 2006).

Learning Styles and Personality Types

The success of students in an online learning environment may depend on their preferred

learning styles (Harrell, 2008). Students have various interests, personalities, behaviors, and

ways of interacting with their environments. Learning style refers to the preferred way in which

an individual receives, interprets, processes, and responds to information (DeTure, 2004; Evans,

Forney, Guido, Patton, & Renn, 2010; Harrell & Bower, 2011; Oh & Lim, 2005). Although

researchers have found learning styles to be relatively stable in individuals over time, life

experiences and demands from the learning environment can cause a student's preferred learning

style to change (DeTure, 2004; Evans et al., 2010; Liu, 2007; Oh & Lim, 2005). The classroom

environment associated with learning online, including the physical isolation of the student from

other students and the instructor, can negatively impact the success of a student who prefers a

learning style that is not addressed in this course format (Harrell & Bower, 2011).

There are many learning style theories and instruments used to determine an individual's

preferred style. The Myers-Briggs Type Indicator (MBTI), based on the theory of renowned

psychologist Carl Jung, is one of the most commonly used instruments used to assess personality

type, closely related to learning style (Evans et al., 2010; Soles & Moller, 2001). Based on

results of the MBTI, a person can be categorized into one of 16 possible personality types,

relative to preferences in four areas: (a) interaction with the environment, (b) receiving

information from the environment, (c) organizing information and making decisions, and (d)

planning and acting (Evans et al., 2010; Mupinga et al., 2006; Soles & Moller, 2001). *Extraverts*

(E) enjoy activity and interacting with people, but *introverts* (I) tend to be reflective thinkers who

enjoy being alone. Individuals who prefer to use their senses to observe facts and details are in

the *sensing* (S) group, whereas those who are more imaginative and trust hunches are in the

intuition (N) *area*. Those who analyze, question, and make objective decisions based on facts

and logic are in the *thinking* (T) area, but those who are more subjective in their decision-making

are in the *feeling* (F) group. Finally, individuals in the *judging* (J) category typically meet

deadlines and tend to like structure and following a plan, and those in the *perceiving* (P) group are generally adaptable, flexible, and spontaneous (Evans et al., 2010).

Several other learning style inventories are commonly used to classify students strictly based on how they like to receive information. Auditory learners prefer to listen, and visual learners prefer to see information, such as through reading text. Tactile learners prefer to touch and feel, and kinesthetic learners like active, hands-on learning (Battalio, 2009; Harrell & Bower, 2011).

Although much variation exists among online courses, some researchers have suggested that introverts might be more successful in distance education than extraverts (Neuhauser, 2002; Soles & Moller, 2001). Whereas an extraverted individual may feel isolated while taking an online course, an introverted student may enjoy the anonymity it offers. Also, because of the large amount of reading and viewing of materials required for online courses, visual learners could have more success than auditory learners (Neuhauser, 2002).

The literature provides conflicting information regarding the relationship of learning styles to student success in distance education. The inconsistency in findings could be because learning styles can change over time or because there are so many different theories and ways of measuring learning styles (Kerr et al., 2006). Battalio (2009) asserted that reflective learners performed better in distance education than active learners. Harrell and Bower (2011) contended that auditory learners were more likely to complete online courses than kinesthetic, tactile, or visual learners. However, results from a number of other studies suggested that there was no significant relationship between student learning styles and success in online courses (DeTure, 2004; Mupinga et al., 2006; Neuhauser, 2002; Oh & Lim, 2005). Aragon, Johnson, and Najmuddin (2002) reported that most online students preferred "reflective observation (learning

by watching and listening) and abstract conceptualization (learning by thinking); " however, the students who preferred "active experimentation (learning by doing)" were as successful (pp. 242-243).

Learning Environment

Harasim (2000) and Rovai (2004) suggested that the most effective online learning environment is based on *constructivism*, an educational philosophy founded by Jean Piaget. This concept involves a process of learning by students whereby they actively engage with the course content and build their own understanding of it. Ideally, an online course is learner-centered and includes open-ended questions, interactive activities, case studies, discussions, and group work (Harasim, 2000; Rovai, 2004). The instructor assumes the role of a facilitator, encourager, and tutor. Students who are intrinsically motivated and capable of actively taking control of their learning generally perform better in this type of class than those who are passive learners. Many traditional face-to-face classes are teacher-centered, with the instructor assuming the role of the "sage on the stage." The student has the passive role of a listener who is expected to retain facts (Rovai, 2004).

Research on Overall Student Success in Distance Education

Researchers agree that the most successful students in online learning are self-disciplined, self-motivated, goal-oriented, responsible, and organized (Johnson & Berge, 2012; Kenner & Weinerman, 2011; Kerr et al., 2006; Kiely, Sandmann, & Truluck, 2004; Neuhauser, 2002; Rovai, 2004; Wojciechowski & Palmer, 2005). These students also possess skills in time management, multitasking, and critical thinking. In addition, they are able to take responsibility for their own learning and work independently. Most of these characteristics align with those of an adult learner, or a nontraditional student (Wojciechowski & Palmer, 2005). As older students,

nontraditional students are usually more mature and have prior knowledge and life experiences they want to relate to their education in some manner (Johnson & Berge, 2012; Kenner & Weinerman, 2011; Kiely et al., 2004). Adult learners have much to offer as students, but there are potential obstacles to their success in higher education. These include the lack of financial resources, a lack of self-confidence, under-preparedness for collegiate level coursework, the lack of sufficient time, and a lack of academic focus (Compton et al., 2006; Kenner & Weinerman, 2011; Kiely et al., 2004; Wyatt, 2011).

Despite unprecedented enrollments in distance education at higher education institutions in the 21st century, research has yielded mixed findings relative to its effectiveness and the overall success of students in its courses and programs. Studies have varied in their definitions of successful learning outcomes. Some researchers focused on assessment scores and final course grades. Others focused on degree attainment, course completion, and persistence, "the behavior of continuing action despite the presence of obstacles" (Rovai, 2003, p. 1). The typical community college student has at least some characteristics of a student at risk for noncompletion. Because the majority of online students tend to be nontraditional students, they also usually have some of those same characteristics that put them at risk. There has been minimal research conducted specifically on the success of students in online courses at the community college level (Harrell & Bower, 2011; Xu & Jaggars, 2011b).

Non-Community College Studies

Neuhauser (2002) compared an online and a face-to-face section of an undergraduate Principles of Management course to determine if significant differences existed in the learning outcomes of the two sections. Both class sections were taught by the same instructor and required the same activities, assignments, and assessments. Students self-selected the course

section into which they enrolled, and there was no significant difference at the beginning of the semester between the students in each section with respect to gender, age, and work history. Results indicated that the retention rate was the same for both sections. However, the attrition rate for students 22-years-old and younger was higher than for those students older than 22-years-old, particularly in the online section. Test scores and final grades were slightly higher in the online class but not significantly so (Neuhauser, 2002).

Sue (2005), Scherrer (2011), and Helms (2014) conducted studies similar to that of Neuhauser (2002), in that they compared the performance of students in equivalent online and traditional course sections (i.e., both sections taught by the same instructor; using the same text, materials, assignments, assessments). Sue compared students in class sections of an introductory business statistics course. Although students in both sections scored relatively the same on a pretest administered at the beginning of the semester, students in the traditional class section scored higher than those in the online section on the remaining four exams. Scores for two of those four exams were significantly higher in the traditional class section as compared to scores of in the online section. It is important to note that the two exams the online students scored lower on, as compared to the traditional class students, were exams the online students had to take proctored on campus—the midterm and the final. The researcher attributed a portion of this finding to the change in testing environment for the online students (Sue, 2005).

Scherrer (2011) compared the performance of students from three different sections of an instructor's introductory statistics course. One section was a traditional face-to-face class that met twice a week. The second section was a fully online class, and the third section was a hybrid class that met once a week. Students in all class sections took three in-class proctored exams. Those in the traditional class performed better as measured by the final course averages

(Scherrer, 2011).

Helms (2014) compared the performance of students in an online section of an undergraduate psychology course at a university to that of students in a traditional face-to-face section of the course. Students in the traditional class earned significantly higher final course grades than students in the online class. Also, 65% of the online students failed to submit at least one assignment, as compared to 19% of students in the face-to-face class (Helms, 2014).

Allen et al. (2004) compared student performance in distance education courses to that in traditional courses through a meta-analysis of quantitative literature. Over 500 manuscripts were analyzed, and the conclusion was that students did only slightly better in the distance education courses. A U.S. Department of Education (2010) meta-analysis involved the examination of empirical research over a period of 12 years related to the effectiveness of online learning. Although the primary target of the study was initially K-12, the majority of the studies located were related to online learning at the higher education level. According to the final report the performance of students was modestly better in online learning than in traditional face-to-face learning (U.S. Department of Education, 2010).

Pontes and Pontes (2012) explored the relationship between enrollment in distance education and the rate of academic progress of students from first-generation low-income (FGLI) households. Their study was based on data from the 2008 National Postsecondary Student Aid Survey (NPSAS) conducted by the National Center for Education Statistics. The researchers defined a student who had no parent with an earned bachelor's degree as a first-generation student. A low-income student was from a home having a household income no greater than 150% of the federal poverty income level. The researchers concluded that FGLI students in

distance education courses were more likely to experience academic progress (i.e., continue to enroll and enroll full-time; Pontes & Pontes, 2012).

Community College Studies

Xu and Jaggars (2011a) analyzed student data over a 5-year period from institutions of the Washington State Board of Community and Technical Colleges to compare academic outcomes of students enrolled in online courses to those of students in hybrid and face-to-face courses. Students in online courses were more likely to withdraw or fail than those in face-to-face courses. Also, students who took a greater proportion of online courses were less likely to complete a program of study or transfer to a university (Xu & Jaggars, 2011a).

Similarly, Xu and Jaggars (2011b) examined data over a 4-year period from the Virginia Community College System (VCCS) to compare the success of students in online and face-to-face classes of introductory college-level English and mathematics courses. The students who took the courses online were significantly more likely to withdraw. This was true for both the English and math courses. In addition, the percentage of students who made a final grade of a "C" or better was higher for students in the face-to-face sections for both the English and math courses (Xu & Jaggars, 2011b).

Shea and Bidjerano (2014) analyzed NCES Beginning Postsecondary Student Survey (BPS 04/09) data to compare degree completion rates of community college students enrolled in distance education courses during their first year to those of students enrolled in all face-to-face courses during the first year. They concluded that the students who participated in online education during their first year of college had higher rates of degree attainment than those who did not take online courses during the first year.

Research on Factors Associated with Success in Distance Education

Although there appear to be enrollment patterns associated with the characteristics of distance education students, a lack of research exists relative to the relationship between each of these characteristics and student success in online courses. The existing studies have varied in whether the factors have been investigated individually or in groups.

Prominent Studies

Dupin-Bryant (2004) studied university students enrolled in online courses for one semester from various academic disciplines to identify preentry variables that predict online course completion. Students who did not complete tended to be lower-division students with cumulative GPAs that were lower than those of students who completed. Also, the noncompleters tended to have had fewer online courses in the past than the completers (Dupin-Bryant, 2004).

Park and Choi (2009) examined factors that influenced the persistence of university students in online courses over a period of 2 years. The researchers concluded that student age, gender, and educational level had no significant effect on persistence. However, they discovered that students were less likely to withdraw from an online course they considered to be relevant to their lives, experiences, and goals. Also, students were less likely to withdraw when family, friends, coworkers, and employers supported them in their efforts to pursue an education (Park & Choi, 2009).

Wojciechowski and Palmer (2005) investigated the relationship of various student characteristics to success in an online business course at a community college over a period of 3 years. For purposes of the study success was defined as receiving a final grade of a "C" or better in the class. The same instructor taught each section of the course and used the same textbook in

each class. The researchers concluded that a significant relationship existed between each of the following student characteristics (in order from highest to lowest significance) and success in an online business course at the community college: overall GPA, attendance at an optional class orientation session, number of course withdrawals in the past, ASSET placement test reading score, number of online courses in the past, student age, and ACT English score. There was no significant relationship between student success in the online business course and these variables: full or part-time status, gender, ACT composite score, ACT reading score, semester format (8-week or 16-week), and ASSET writing score (Wojciechowski & Palmer, 2005).

Aragon and Johnson (2008) investigated the differences in characteristics of students who successfully completed online courses at one community college during a single semester as compared to students who did not successfully complete the online courses. In this study successful completion was defined as earning a final grade of "A," "B," "C," or "D." There was no significant difference between completers and noncompleters relevant to student age, ethnicity, financial aid eligibility, or placement into developmental courses. There was a significant difference between completers and noncompleters of online courses with respect to gender, GPA, number of hours in which enrolled, and number of online hours in which enrolled. Female students had a higher completion rate than males. Students having higher GPAs completed online courses at a higher rate than students with lower GPAs. Completers tended to enroll in more hours than noncompleters, and they tended to take more online hours (Aragon & Johnson, 2008).

Harrell and Bower (2011) examined how well learning styles and various demographic characteristics could predict the persistence of students in online courses at the community college level. The demographic characteristics studied included the following: age, gender,

race, GPA, enrollment status, financial aid status, marital status, number of children, and employment status. Four learning styles were considered: auditory, visual, tactile, and kinesthetic. Persistence was defined as completion of an online course, but a student could have completed a course and not have earned a passing grade. Auditory learning style was found to be associated with student withdrawal from online courses. The researchers concluded that many online courses contained significant amounts of written content. Auditory learners prefer to receive and process information in oral form. Students who prefer an auditory learning style may have had problems comprehending course materials, so they eventually withdrew from the courses. GPA was also found to be associated with persistence. Students with higher GPAs were less likely to withdraw from online courses. The other student characteristics were not found to be statistically significant predictors of persistence (Harrell & Bower, 2011).

Predominant Factors

Demographic. Nontraditional students tend to have lower overall completion rates in higher education than traditional-aged students; however, research is contradictory relevant to the relationship between student age and online success (Compton et al., 2006). The results from several studies indicated that completers tended to be older students as opposed to traditional-aged students (Muse, 2003; Neuhauser, 2002). Wojciechowski and Palmer (2005) discovered that younger online students did not perform as well as older students. However, other researchers reported that student age had no relationship to online course completion (Aragon & Johnson, 2008; Park & Choi, 2009).

Aragon and Johnson (2008) also found no relationship between student ethnicity and completion of online courses. Concerning gender, they concluded the completion rate was higher for females than for males. On the contrary, Park and Choi (2009) observed no effect on

course completion based on student gender.

Academic. Collegiate readiness is usually assessed by scores on the traditional ACT test, required by many colleges for admission, and/or placement tests such as the ACT Compass exam, designed to evaluate skills in reading, writing, and mathematics (Aragon & Johnson, 2008). The literature provides conflicting information regarding the relationship between collegiate readiness and online student success. In several studies the researchers found that the higher a student scored on a reading placement exam, the more likely it was that the student would succeed in an online class (Kerr et al., 2006; Wojciechowski & Palmer, 2005). However, Aragon and Johnson (2008) reported that academic readiness as determined by placement scores had no relationship to the completion of online courses. Although Wojciechowski and Palmer (2005) did find a relationship between success and reading placement scores, they did not find any relationship between student success and ACT composite scores.

Studies reviewed support a relationship between GPA and student success in distance education. Higher cumulative grade point averages were associated with online course completion and better grades in classes (Aragon & Johnson, 2008; Dupin-Bryant, 2004; Hachey et al., 2013; Harrell & Bower, 2011; Muse, 2003; Wojciechowski & Palmer, 2005).

Enrollment. With regard to student course load, Aragon and Johnson (2008) reported that students who did not complete online courses tended to be enrolled in fewer hours than those who did complete. Conversely, Wojciechowski and Palmer (2005) found that student enrollment status had no statistically significant relationship with online success.

Educational level is determined by the number of credit hours a student has completed and refers to the classification of a student as a freshman, sophomore, junior, or senior. Dupin-Bryant (2004) observed that lower-division online students tended to be noncompleters more

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often than upper-division students. Muse (2003) found that the more credit-hours community college students had completed, the more successful they were in online classes. In contrast to these findings are the results of a study conducted by Park and Choi (2009) that showed student educational level had no effect on online course completion.

The number of online classes students have taken may be an indicator of technological proficiency. Researchers consistently found that students who had previously taken online courses or had relevant computer experience were more successful in distance learning than those who had less online experience (Dupin-Bryant, 2004; Hachey et al., 2013; Harrell & Bower, 2011; Kerr et al., 2006).

Summary

Colleges and universities have expanded distance education offerings to increase student access to postsecondary programs and courses.   Their primary goal has been to improve the educational attainment levels of the nation's citizens. Demand and enrollment in online education has been high, but questions exist relevant to student learning outcomes. Despite the promise and potential of this educational format, studies have associated it with higher student withdrawal rates (Allen & Seaman, 2015; Aragon & Johnson, 2008; Hachey et al., 2013; Harrell & Bower, 2011; Wojciechowski & Palmer, 2005). In addition, research has indicated that online students tend to earn lower grades than students in comparable face-to-face classes (Capra, 2011; Helms, 2014; Scherrer, 2011; Sue, 2005; Xu & Jaggars, 2011b). The existence of contrasting information in the literature exposes the need for additional empirical research relative to the overall success of students in online courses as well as on factors associated with success in distance education. In addition, there needs to be increased emphasis on studies in both areas as they concern community college students.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this study was to determine if significant differences existed in overall student success at the community college level in online courses as compared to in face-to-face courses taught by the same instructor and across disciplines. In addition, the researcher investigated the relationship between each of the following attributes and student success in online courses: (a) demographic (age group and gender); (b) academic (composite ACT score); (c) enrollment (student course load and student classification); and (d) external environmental (financial aid status, first-generation college student status, marital status, and dependent children status).

The researcher used a nonexperimental quantitative research methodology with a comparative and correlational design. Quantitative research is an empirical, evidence-based type of research supported by a logical positivist or scientific paradigm (McMillan & Schumacher, 2010). This type of research involves the investigation of observed phenomena, deductive reasoning, the systematic analysis of facts, and the use of statistical data to make predictions. Its primary goal is to provide objective results that can be replicated and generalized to a larger population (McMillan & Schumacher, 2010).

In nonexperimental research there is no direct intervention or manipulation of any conditions (McMillan & Schumacher, 2010). A comparative design is used to determine if there are differences between groups (i.e., success of students taking an online course versus those taking a face-to-face course), and a correlational design is used to determine if a relationship exists between phenomena (i.e., student success in an online course and composite ACT;

McMillan & Schumacher, 2010). Thus, the study design is appropriate for testing the following

hypotheses and for answering the research questions posed for the study.

Research Questions and Null Hypotheses

This study involved an analysis of data relevant to demographic, academic, enrollment,

and external environmental attributes of students enrolled in online and face-to-face sections of

courses taught by the same instructor within the same semester at a community college during a

3-year period. The following questions and null hypotheses guided the research:

Research Question 1: Is there a significant difference in student success as measured by the

proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final

course grade between students taking a course online and students taking the same course with

the same instructor face-to-face?

$H_0 1$: There is no significant difference in student success as measured by the proportion

of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course

grade between students taking a course online and students taking the same course with

the same instructor face-to-face.

Research Question 2: Is there a significant difference in student success as measured by the

proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final

course grade between traditional-aged and nontraditional-aged students based on instructional

method (online or face-to-face)?

$H_0 2_1$: There is no significant difference in student success as measured by the proportion

of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course

grade between traditional-aged and nontraditional-aged students for online students.

$H_0 2_2$: There is no significant difference in student success as measured by the proportion

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of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between traditional-aged and nontraditional-aged students for face-to-face students.

Research Question 3: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students based on instructional method (online or face-to-face)?

H_03_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students for online students.

H_03_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students for face-to-face students.

Research Question 4: Is there a significant difference in the mean composite ACT scores among students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade with regard to instructional method (online or face-to-face)?

H_04_1: There is no significant difference in the mean composite ACT scores among students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade with regard to instructional method (online or face-to-face).

H_04_2: There is no significant difference in the mean composite ACT scores between students taking online courses and students taking face-to-face courses.

H_o4_3: There is no significant difference in the mean composite ACT scores among students' final course letter grades (A, B, C, D, F, or W).

Research Question 5: Is there a significant difference in student success as measured by the

proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students based on instructional method (online or face-to-face)?

H$_0$5$_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students for online students.

H$_0$5$_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students for face-to-face students.

Research Question 6: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores based on instructional method (online or face-to-face)?

H$_0$6$_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores for online students.

H$_0$6$_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores for face-to-face students.

Research Question 7: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between Pell Grant-eligible students and non-Pell Grant-eligible students based on instructional method (online or face-to-face)?

H_07_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between Pell Grant-eligible students and non-Pell Grant-eligible students for online students.

H_07_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between Pell Grant-eligible students and non-Pell Grant-eligible students for face-to-face students.

Research Question 8: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students based on instructional method (online or face-to-face)?

H_08_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students for online students.

H_08_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students for face-to face students.

Research Question 9: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students based on instructional method (online

or face-to-face)?

$H_0 9_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students for online students.

$H_0 9_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students for face-to-face students.

Research Question 10: Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children based on instructional method (online or face-to-face)?

$H_0 10_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children for online students.

$H_0 10_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children for face-to-face students.

Instrumentation

This study involved secondary data analysis of quantitative data extracted from the student information database system of the participating institution. Because the study covered courses taught within the past 3 years, these data are considered archival data.

Secondary data were appropriate for this study for several reasons. The data had already

been collected and provided a large sample size. Also, according to McMillan and Schumacher

(2010) the findings that result from secondary data analysis tend to have a high degree of

reliability and validity. Reliability refers to the consistency with which the instrument measures

what it is designed to measure (Gay, Mills, & Airasian, 2009). Validity is the extent to which the

instrument measures what it is supposed to measure. It indicates if the results are accurate and

meaningful. Both reliability and validity are important measures of rigor in quantitative research

(Gay et al., 2009).

Population Selection

The site for this study was an accredited public community college of the Tennessee

Board of Regents (TBR) system. The 2-year, multicampus institution is located in southern

Middle Tennessee and currently has a total enrollment of approximately 5,000 students. It offers

associate's degrees, certificates, and flexible learning pathways designed for transfer or

workforce training (The Carnegie Classification of Institutions of Higher Education, n.d.; TBR,

2014; THEC, 2015). From fall 2012 through spring 2015, the period from which data were

collected, the overall student population averaged: 76% traditional-aged and 24%

nontraditional-aged, 61% females and 39% males, 80% White and 20% from all other races

combined (including 9% Black, 4% Hispanic, and 2% Asian/Pacific Islander), 44% enrolled full-

time and 56% enrolled part-time, and a composite ACT score of 18.9 (TBR, 2014; THEC, 2013;

THEC, 2014; THEC, 2015). In addition, 75% of traditional-aged students were eligible to

receive federal Pell grants (THEC, 2013; THEC, 2014; THEC, 2015).

The target population included all students enrolled in course sections taught by

instructors who taught both online and face-to-face sections of the same course within the same

semester from fall 2012 through spring 2015 (excluding summer sessions, Learning Support courses, and Regents Online Degree Program courses). The researcher's intent was to compare student success in online versus face-to-face courses in which as many conditions as possible were equal (i.e., same instructor, same course syllabus, same or similar assignments and assessments) so the variables in the study could be tested. Students self-selected the course section into which they registered. Disciplines represented included the following: accounting, anthropology, biology, business, chemistry, economics, English, history, information systems, mathematics, political science, psychology, sociology, speech, and theater. The total number of students involved in the study exceeded 4,000. This number was sufficient to show statistically significant results in a quantitative study.

Data Collection

Prior to the study the researcher obtained approval to conduct research from the Institutional Review Board (IRB) at East Tennessee State University. Subsequently, permission was granted from the administration at the participating institution to conduct the study and collect existing data from the student information database system for secondary analysis.

Data relevant to the research questions and hypotheses were collected on all students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester during the following semesters: fall 2012, spring 2013, fall 2013, spring 2014, fall 2014, and spring 2015. To protect the identities of the students and instructors and to maintain anonymity, unique identifier numbers were used in place of the identification numbers typically used in the institutional database. Members of the administrative computer programming staff at the participating institution assigned the numbers

and provided the researcher with data that contained no personally identifying information on participants.

Data Analysis

The data were analyzed using IBM-SPSS version 21.0. A chi-square (χ^2) test of independence (two-way contingency table analysis) was used to analyze the data relevant to research questions 1-3 and 5-10. This type of statistical test is appropriate for qualitative data that are categorical, or nominal (i.e., gender, marital status). It evaluates discrepancies between observed and expected frequencies and is used to determine if variables are independent (Witte & Witte, 2010). A two-way analysis of variance (two-way ANOVA) was used to analyze the data associated with research question 4. This type of statistical test analysis allows a researcher to analyze two independent variables, or factors, as well as any interaction between the factors (Witte & Witte, 2010). The .05 level of significance was the alpha level defined for this study and used to test each null hypothesis. Specific statistical procedures are explained in detail in Chapter 4.

Summary

Chapter 3 of this study contains information on the research methodology, design of the study, research questions, null hypotheses, population-sample selection, instrumentation, data collection methods, and data analysis procedures. Chapter 4 includes a presentation of the results of study and an analysis of the data. Chapter 5 includes a summary of the study and its results, as well as conclusions, implications, and recommendations for future research and practice.

CHAPTER 4

DATA ANALYSIS

Introduction

In recent years government leaders at both the state and national levels have emphasized increased educational attainment by citizens. Their common goal is to increase the percentage of college graduates in the United States population. To facilitate degree and certificate completion by students postsecondary institutions have increased educational access through alternative course delivery options and innovative program options. Because of the convenience and flexibility they offer, online courses have been in high demand. This course format seems to provide a way for students with family and work responsibilities to participate in higher education more easily than conventional face-to-face classes. However, many students who enroll in courses with this instructional format are considered high-risk for academic failure (i.e., failing classes, dropping classes, and withdrawing from school). Community colleges typically serve a greater population of this type of student than 4-year universities (Coley, 2000).

The purpose of this study was to determine if significant differences existed in overall student success at the community college level in online courses as compared to in face-to-face courses taught by the same instructor and across disciplines. In addition, the researcher investigated the relationship between each of the following factors and student success in online courses: (a) demographic (age group and gender); (b) academic (composite ACT score); (c) enrollment (student course load and student classification); and (d) external environmental (financial aid status, first-generation college student status, marital status, and dependent children status). Information gained from this study could be used to improve online courses in a number of ways, from student advisement and course development to instruction.

In this study the researcher considered student success to be demonstrated by the final course letter grades earned in the classes included in the study. Although other options exist to measure and define student success, final grades are commonly used, as indicated by the literature (Aragon & Johnson, 2008; Neuhauser, 2002; Wojciechowski & Palmer, 2005; Xu & Jaggars, 2011b). Final course grades had six possible levels and were assigned to students by the participating institution based on class performance relative to expected learning outcomes. Appendix A contains a list of all research variables and their definitions, including those for final grades.

This study involved secondary data analysis of quantitative data extracted from the student information database system of the participating institution, a public 2-year community college located in southern Middle Tennessee. The target population included students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester during the following semesters: fall 2012, spring 2013, fall 2013, spring 2014, fall 2014, and spring 2015. Disciplines represented included the following: accounting, anthropology, biology, business, chemistry, economics, English, history, information systems, mathematics, political science, psychology, sociology, speech, and theater. The total number of students involved in the study was 4,604.

Ten research questions guided the study, and 20 hypotheses were tested. A two-way analysis of variance (two-way ANOVA) was used to analyze the data associated with research question 4. A chi-square (χ^2) test of independence (two-way contingency table analysis) was used to analyze the data relevant to all other research questions.

Analysis of Research Questions

Research Question 1

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students taking a course online and students taking the same course with the same instructor face-to-face?

H_01: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students taking a course online and students taking the same course with the same instructor face-to-face.

A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade, varied depending on instructional method. The two variables were final course grade (A, B, C, D, F, or W) and instructional method (online or face-to-face). Student success and instructional method were found to be significantly related, Pearson χ^2 (5, $N = 4,272$) = 49.15, $p < .001$, Cramer's $V = .11$. Therefore, the null hypothesis was rejected.

Table 1 indicates the percentage of students earning each final course letter grade by instructional method. Figure 1 shows the count of the number of students earning each final course letter grade by instructional method.

Table 1

Percentage of Students Earning Each Final Course Letter Grade by Instructional Method

Instructional Method	Final Course Grade						Total
	A	B	C	D	F	W	
Face-to-Face	38.0	25.6	16.9	6.1	10.2	3.2	100.0
Online	42.6	24.2	11.7	4.4	11.3	5.8	100.0
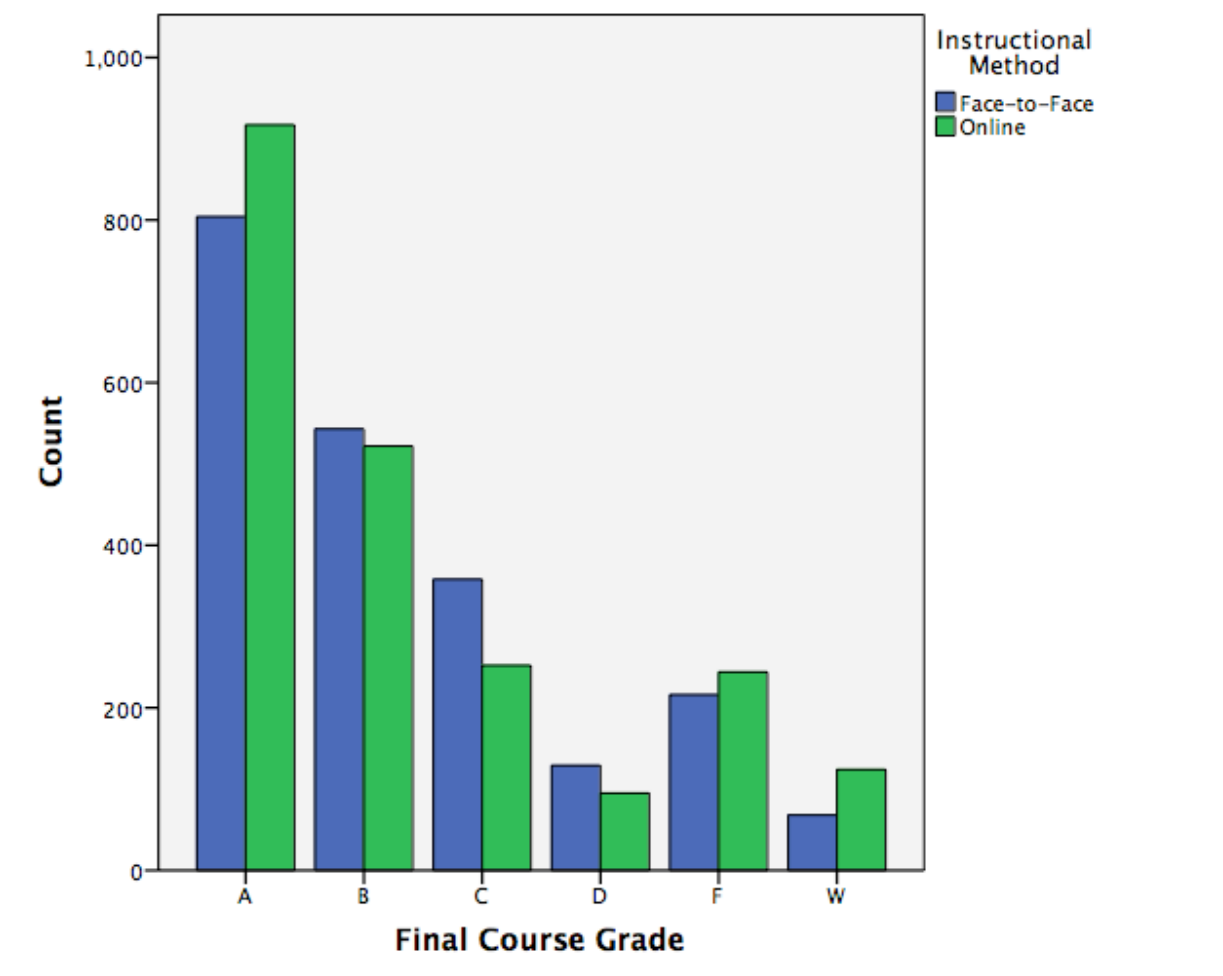
Figure 1. Number of students earning each final letter grade by instructional method

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 2 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were eight significant pairwise differences, between "A vs. C," "B vs. W," "C vs. F," " C vs. W," "D vs. W," "A vs. D," "B vs. C," and "A vs. W." No significant differences were identified between other pairs of grades. In general, students taking a class online were significantly more likely to make an "A" than students taking a class face-to-face. However, students taking a class online were more likely to make an "F" or a "W" than students taking a class face-to-face. Students taking a class face-to-face were more likely to make a "B," "C," or "D" than students taking a class online.

Table 2

Results from the Pairwise Comparisons Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
A vs. C	25.82*	<.001 (.003)	.11
B vs. W	15.79*	<.001 (.003)	.11
C vs. F	14.52*	<.001 (.003)	.12
C vs. W	31.76*	<.001 (.003)	.20
D vs. W	20.39*	<.001 (.003)	.22
A vs. D	9.39*	.002 (.004)	.07
B vs. C	9.26*	.002 (.004)	.07
A vs. W	8.89*	.003 (.004)	.07
F vs. W	7.34	.007 (.004)	.11
D vs. F	6.81	.009 (.005)	.10
A vs. B	4.80	.028 (.005)	.04
B vs. D	3.23	.072 (.006)	.05
B vs. F	2.09	.149 (.006)	.04
C vs. D	.08	.775 (.007)	.01
A vs. F	.01	.927 (.008)	<.01

*p value ≤ alpha

Research Question 2

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between traditional-aged and nontraditional-aged students based on instructional method (online or face-to-face)?

H$_0$2$_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between traditional-aged and nontraditional-aged students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between traditional-aged and nontraditional-aged students for online students. The two variables were final course grade (A, B, C, D, F, or W) and age group (traditional-age or nontraditional-age). Pearson χ^2 (5, $N = 1,879$) $= 27.58$, $p < .001$, Cramer's $V = .12$. Therefore, the null hypothesis was rejected. Table 3 indicates the percentage of students earning each final course letter grade for online students by age group.

Table 3

Percentage of Online Students Earning Each Final Course Letter Grade by Age Group

| Age Group | Final Course Grade | | | | | | Total |
	A	B	C	D	F	W	
Traditional-age	35.3	24.9	12.9	5.7	14.7	6.5	100.0
Nontraditional-age	45.3	24.4	11.0	3.3	9.7	6.3	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 4 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were two significant pairwise differences, between "A vs. F" and "A vs. D." No significant differences were identified between other pairs of grades. In general, traditional-age students were significantly more likely to make a "D" or an "F" on a final grade in an online course than nontraditional-age students. Nontraditional-age students were more likely to make an "A" on a final grade in an online course than traditional-age students.

Table 4

Results from the Pairwise Comparisons of Final Course Grade for Online Students by Age Group Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (alpha)	Cramer's V
A vs. F	18.07*	<.001 (.003)	.14
A vs. D	11.07*	.001 (.004)	.12
A vs. C	6.89	.009 (.004)	.08
B vs. F	5.49	.019 (.004)	.09
A vs. B	5.09	.024 (.005)	.07
B vs. D	4.49	.034 (.005)	.09
D vs. W	3.05	.081 (.006)	.12
F vs. W	2.73	.098 (.006)	.09
C vs. D	2.13	.145 (.007)	.08
A vs. W	2.00	.157 (.008)	.05
C vs. F	1.73	.189 (.010)	.06
B vs. C	.68	.411 (.013)	.03
C vs. W	.30	.586 (.017)	.03
D vs. F	.26	.612 (.030)	.03
B vs. W	<.01	.957 (.050)	<.01

*p value ≤ alpha

H_02_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between traditional-aged and nontraditional-aged students for face-to-face students.

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A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between traditional-aged and nontraditional-aged students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and age group (traditional-age or nontraditional-age). Pearson χ^2 (5, $N = 1{,}926$) = 34.61, $p < .001$, Cramer's $V = .13$. Therefore, the null hypothesis was rejected. Table 5 indicates the percentage of students earning each final course letter grade for face-to-face students by age group.

Table 5

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Age Group

Age Group	Final Course Grade						Total
	A	B	C	D	F	W	
Traditional-age	33.8	25.8	18.7	7.0	11.6	3.1	100.0
Nontraditional-age	47.2	24.8	11.9	2.6	7.9	5.6	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 6 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were five significant pairwise differences, between "A vs. C," "A vs. D," "D vs. W," "C vs. W," and "A vs. F." No significant differences were identified between other pairs of grades. In general, traditional-age students were significantly more likely to make a "C," "D," or an "F" and less likely to make a "W" on a final grade in a face-to-face course than nontraditional-age students. Nontraditional-age students were more likely to make an "A" or a "W" and less likely to make an "F" on a final grade in a face-to-face course than traditional-age students.

Table 6

Results from the Pairwise Comparisons of Final Course Grade for Face-to-Face Students by Age Group Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (alpha)	Cramer's V
A vs. C	16.00*	<.001 (.003)	.13
A vs. D	13.45*	<.001 (.003)	.13
D vs. W	12.83*	<.001 (.003)	.26
C vs. W	10.34*	.001 (.004)	.16
A vs. F	9.41*	.002 (.004)	.10
F vs. W	7.71	.005 (.004)	.17
B vs. D	6.12	.013 (.005)	.10
A vs. B	5.78	.016 (.005)	.07
B vs. W	4.21	.040 (.006)	.09
B vs. C	3.62	.057 (.006)	.07
D vs. F	1.97	.161 (.007)	.08
B vs. F	1.84	.176 (.008)	.05
C vs. D	1.66	.198 (.010)	.06
A vs. W	.70	.403 (.013)	.03
C vs. F	.07	.797 (.017)	.01

*p value ≤ alpha

Research Question 3

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between male and female students based on instructional method (online or face-to-face)?

H_03_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between male and female students for online students. The two variables were final course grade (A, B, C, D, F, or W) and gender (male or female). Pearson χ^2 (5, $N = 2,154$) = 8.84, $p = .116$, Cramer's $V = .06$. Therefore, the null hypothesis was retained. Table 7 indicates the percentage of students earning each final course letter grade for online students by gender.

Table 7

Percentage of Online Students Earning Each Final Course Letter Grade by Gender

Gender	Final Course Grade						Total
	A	B	C	D	F	W	
Male	38.5	25.0	11.5	4.6	13.9	6.5	100.0
Female	44.1	24.0	11.8	4.3	10.4	5.5	100.0

H_03_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between male and female students for face-to-face students.

A two-way contingency table analysis was conducted to evaluate whether student success

as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between male and female students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and gender (male or female). Pearson χ^2 (5, $N = 2{,}118$) $= 26.99$, $p < .001$, Cramer's $V = .11$. Therefore, the null hypothesis was rejected. Table 8 indicates the percentage of students earning each final course letter grade for face-to-face students by gender.

Table 8

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Gender

| Gender | Final Course Grade | | | | | | Total |
	A	B	C	D	F	W	
Male	33.1	24.9	18.5	7.2	13.0	3.3	100.0
Female	41.5	26.1	15.7	5.3	8.2	3.2	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 9 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were four significant pairwise differences, between "A vs. F," "B vs. F," "A vs. C," and "A vs. D." No significant differences were identified between other pairs of grades. In general, male students were significantly less likely to make an "A" or a "B" and more likely to make a "C," "D," or an "F" on a final grade in a face-to-face course than female students. Female students were more likely to make an

"A" or a "B" and less likely to make a "C," "D," or an "F" on a final grade in a face-to-face

course than male students.

Table 9

Results from the Pairwise Comparisons of Final Course Grade for Face-to-Face Students by Gender Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (alpha)	Cramer's V
A vs. F	20.02*	<.001 (.003)	.14
B vs. F	9.85*	.002 (.004)	.11
A vs. C	9.11*	.003 (.004)	.09
A vs. D	8.16*	.004 (.004)	.09
B vs. D	3.39	.066 (.005)	.07
C vs. F	2.98	.084 (.005)	.07
A vs. B	2.49	.115 (.006)	.04
F vs. W	2.32	.128 (.006)	.09
B vs. C	2.30	.129 (.007)	.05
A vs. W	1.04	.309 (.008)	.03
D vs. W	.87	.352 (.010)	.07
C vs. D	.55	.458 (.013)	.03
D vs. F	.43	.514 (.017)	.04
C vs. W	.23	.631 (.030)	.02
B vs. W	.10	.758 (.050)	.01

*p value ≤ alpha

Research Question 4

Is there a significant difference in the mean composite ACT scores among students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade with regard to instructional method (online or face-to-face)?

H_o41: There is no significant difference in the mean composite ACT scores among students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade with regard to instructional method (online or face-to-face).

H_o42: There is no significant difference in the mean composite ACT scores between students taking online courses and students taking face-to-face courses.

H_o43: There is no significant difference in the mean composite ACT scores among students' final course letter grades (A, B, C, D, F, or W).

A two-way analysis of variance (two-way ANOVA) was conducted to evaluate the associations between instructional method, composite ACT scores and student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade. The means and standard deviations for composite ACT score as a function of the two factors are presented in Table 10. The ANOVA indicated no significant interaction between instructional method and final course grade, $F(5, 2,866) = 1.52$, $p = .181$, partial $\eta^2 < .01$. Therefore H_o41 was retained. The analysis did yield significant main effects for instructional method, $F(1, 2,866) = 4.23$, $p = .040$, partial $\eta^2 < .01$, and final course grade, $F(5, 2866) = 64.78$, $p < .001$, partial $\eta^2 = .10$. As a result, H_o42 and H_o43 were rejected.

Table 10

Means and Standard Deviations for Composite ACT Score

Instructional Method	Final Course Grade	Mean	SD
Face-to-Face	A	22.14	3.60
	B	20.44	3.48
	C	19.09	3.32
	D	18.85	3.34
	F	18.90	3.39
	W	19.95	3.02
Online	A	21.95	3.46
	B	20.59	3.31
	C	19.58	3.05
	D	19.56	2.87
	F	19.70	3.45
	W	20.18	3.18

The means, standard deviations, and 95% confidence intervals for instructional method to composite ACT are presented in Table 11.

Table 11

95% Confidence Intervals of Pairwise Differences in ACT Composite Scores by Instructional Method

Instructional Method	M	SD	Online
Face-to-Face	19.89	3.72	19.65 to 20.14*
Online	20.26	3.47	

Note: An asterisk indicates the difference in means is significant at .05.

Follow-up pairwise comparisons were conducted to evaluate differences among final course grades and ACT scores. The Tukey HSD procedure was used to control for Type I error across the pairwise comparisons. The means, standard deviations, and 95% confidence intervals for final course grade to mean composite ACT are presented in Table 12. There were eight significant pairwise differences. The significant differences were between an "A" grade and each of the other grades (B, C, D, F, and W) and between a "B" grade and three of the other grades (C, D, and F). Figure 2 shows boxplots of associations between composite ACT scores and final course grade by instructional method.

Table 12

95% Confidence Intervals of Pairwise Differences in Mean Composite ACT Scores by Final Course Grade

Final Course Grade	M	SD	B	C	D	F	W
A	22.05	3.54	1.08 to 2.01*	2.25 to 3.34*	2.14 to 3.77*	2.16 to 3.42*	.98 to 2.94*
B	20.50	3.41		.66 to 1.83*	.56 to 2.25*	.58 to 1.91*	-.59 to 1.41
C	19.26	3.24			-.73 to 1.05	-.73 to .72	-1.88 to .21
D	19.10	3.19				-1.11 to .78	-2.20 to .21
F	19.26	3.43					-1.92 to .26
W	20.09	3.10					

Note: An asterisk indicates the difference in means is significant at .05.
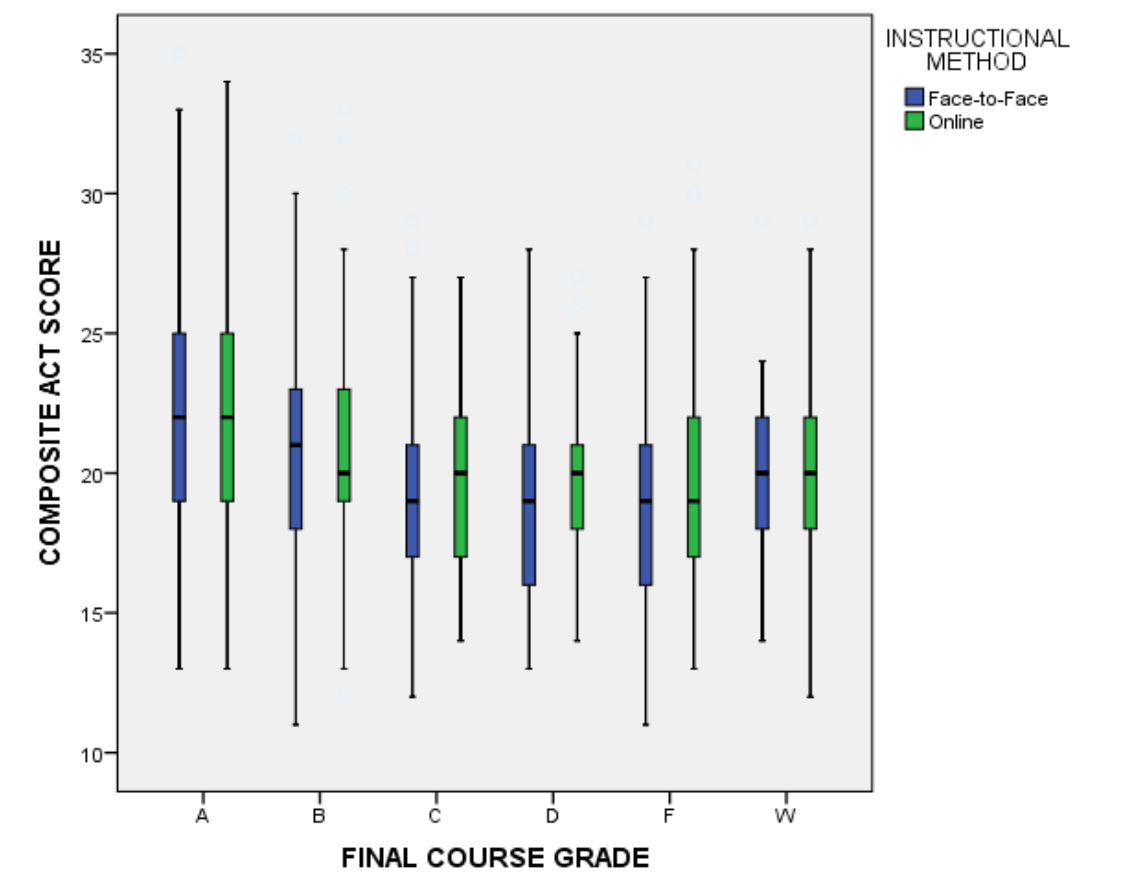
Figure 2. Boxplots of associations between composite ACT score and final course grade by instructional method

Research Question 5

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students based on instructional method (online or face-to-face)?

$H_0 5_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success

as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between full-time and part-time students for online students. The two variables were final course grade (A, B, C, D, F, or W) and student load (full-time or part-time). Pearson χ^2 (5, $N = 2,139$) = 14.78, $p = .011$, Cramer's $V = .08$. Therefore, the null hypothesis was rejected. Table 13 indicates the percentage of students earning each final course letter grade for online students by student load.

Table 13

Percentage of Online Students Earning Each Final Course Letter Grade by Student Load

	Final Course Grade						Total
Student Load	A	B	C	D	F	W	
Full-time	41.4	24.6	13.2	4.2	12.9	3.6	100.0
Part-time	44.0	24.2	10.6	4.6	10.2	6.3	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 14 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were two significant pairwise differences, between "C vs. W" and "F vs. W." No significant differences were identified between other pairs of grades. In general, full-time students were significantly more likely to make a "C" or an "F" and less likely to make a "W" on a final grade in an online course than part-time students. Part-time students were less likely to make a "C" or an "F" and more likely to make a "W" on a final grade in an online course than full-time students.

Table 14

Results from the Pairwise Comparisons of Final Course Grade for Online Students by Student Load Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
C vs. W	10.46*	.001 (.003)	.17
F vs. W	10.81*	.001 (.003)	.18
B vs. W	6.68	.010 (.004)	.10
A vs. W	5.36	.021 (.004)	.07
A vs. F	4.11	.043 (.004)	.06
A vs. C	3.77	.052 (.005)	.06
D vs. W	2.62	.106 (.005)	.11
B vs. F	1.92	.165 (.006)	.05
D vs. F	1.71	.191 (.006)	.07
B vs. C	1.69	.194 (.007)	.05
C vs. D	1.56	.212 (.008)	.07
A vs. B	.48	.487 (.010)	.02
B vs. D	.21	.648 (.013)	.02
A vs. D	.02	.904 (.017)	<.01
C vs. F	.01	.930 (.050)	<.01

*p value ≤ alpha

H_05_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between full-time and part-time students for face-to-face students.

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A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade, varied between full-time and part-time students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and student load (full-time or part-time). Pearson χ^2 (5, $N = 2{,}108$) $= 27.60$, $p < .001$, Cramer's $V = .11$. Therefore, the null hypothesis was rejected. Table 15 indicates the percentage of students earning each final course letter grade for face-to-face students by student load.

Table 15

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Student Load

Student Load	Final Course Grade						Total
	A	B	C	D	F	W	
Full-time	37.6	25.7	18.1	6.5	10.5	1.7	100.0
Part-time	39.4	26.0	14.2	5.3	9.7	5.4	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 16 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were five significant pairwise differences, between "A vs. W," "B vs. W," "C vs. W," "D vs. W," and "F vs. W." No significant differences were identified between other pairs of grades. In general, full-time students were significantly more likely to make an "A," "B," "C," "D," or "F" and less likely to make a "W" on a final grade in a face-to-face course than part-time students. On the contrary, part-time students were more likely to make a "W" and less likely to make an "A," "B," "C," "D," or "F" than full-time students.

Table 16

Results from the Pairwise Comparisons of Final Course Grade for Face-to-Face Students by Student Load Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
A vs. W	18.12*	<.001 (.003)	.15
B vs. W	18.43*	<.001 (.003)	.18
C vs. W	25.99*	<.001 (.003)	.25
D vs. W	18.13*	<.001 (.003)	.31
F vs. W	17.70*	<.001 (.003)	.25
A vs. C	4.03	.045 (.004)	.06
B vs. C	2.77	.096 (.004)	.06
A vs. D	1.40	.237 (.004)	.04
B vs. D	.99	.319 (.005)	.04
C vs. F	.76	.382 (.005)	.04
A vs. F	.50	.481 (.006)	.02
D vs. F	.29	.591 (.006)	.03
B vs. F	.24	.628 (.007)	.02
A vs. B	.08	.783 (.008)	.01
C vs. D	.02	.884 (.010)	.01

*p value ≤ alpha

Research Question 6

Is there a significant difference in student success as measured by the proportion of

students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between freshmen and sophomores based on instructional method (online or face-to-face)?

H$_0$6$_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores for online students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between freshmen and sophomores for online students. The two variables were final course grade (A, B, C, D, F, or W) and student classification (freshman or sophomore). Pearson χ^2 (5, $N = 1,752$) = 25.81, $p < .001$, Cramer's $V = .12$. Therefore, the null hypothesis was rejected. Table 17 indicates the percentage of students earning each final course letter grade for online students by student classification.

Table 17

Percentage of Online Students Earning Each Final Course Letter Grade by Student Classification

Student Classification	Final Course Grade						Total
	A	B	C	D	F	W	
Freshman	33.4	24.9	14.0	4.3	16.8	6.8	100.0
Sophomore	41.8	25.1	11.4	5.2	10.1	6.4	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 18 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were two significant pairwise differences, between "A vs. F" and "B vs. F." No significant differences were identified between other pairs of grades. In general, freshmen were significantly more likely than sophomores to make an "F" than an "A" or "B" on a final grade in an online course. Sophomores were more likely than freshmen to make an "A" or "B" than an "F".

Table 18

Results from the Pairwise Comparisons of Final Course Grade for Online Students by Student Classification Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (alpha)	Cramer's V
A vs. F	22.50*	<.001 (.003)	.16
B vs. F	9.85*	.002 (.004)	.12
A vs. C	7.47	.006 (.004)	.09
D vs. F	7.44	.006 (.004)	.16
F vs. W	3.81	.051 (.004)	.11
A vs. B	2.97	.085 (.005)	.05
C vs. F	2.55	.110 (.005)	.08
C vs. D	2.38	.123 (.006)	.09
A vs. W	1.93	.164 (.006)	.05
B vs. C	1.63	.202 (.007)	.05
D vs. W	.781	.377 (.008)	.06
B vs. D	.612	.434 (.010)	.03
C vs. W	.39	.531 (.013)	.03
B vs. W	.10	.750 (.017)	.01
A vs. D	.01	.918 (.030)	<.01

*p value ≤ alpha

$H_0 6_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between freshmen and sophomores for face-to-face students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between freshmen and sophomores for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and student classification (freshman or sophomore). Pearson χ^2 (5, N = 1,829) = 65.19, p < .001, Cramer's V = .19. Therefore, the null hypothesis was rejected. Table 19 indicates the percentage of students earning each final course letter grade for face-to-face students by student classification.

Table 19

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Student Classification

Student Classification	Final Course Grade						Total
	A	B	C	D	F	W	
Freshman	29.9	24.8	19.1	8.3	14.5	3.4	100.0
Sophomore	41.9	28.5	16.3	3.6	5.9	3.9	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 20 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were eight significant pairwise differences, between "A vs. C," "A vs. D," "A vs. F," " B vs. D," "B vs. F," "C vs. F," "F vs. W," and "D vs. W." No significant differences were identified between other pairs of grades. In general, freshmen were significantly more likely to make an "F" and less likely to make an "A," "B," or "C" on a final grade in a face-to-face course than sophomores. In addition, they were more likely to make a "D" than an "A" or a "B," and they were more likely to make a "C" than an "A." However, freshmen were less likely to make a "W" grade. Sophomores were more likely to make an "A," "B," or "C" and less likely to make an "F" on a final grade in a face-to-face course than freshmen. Also, they were more likely to make an "A" or a "B" than a "D," and they were more likely to make an "A" than a "C." On the contrary, they were more likely to make a "W" grade than freshmen.

Table 20

Results from the Pairwise Comparisons of Final Course Grade for Face-to-Face Students by Student Classification Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	p value (alpha)	Cramer's V
A vs. C	12.68*	<.001 (.003)	.12
A vs. D	26.02*	<.001 (.003)	.19
A vs. F	44.30*	<.001 (.003)	.23
B vs. D	16.84*	<.001 (.003)	.17
B vs. F	28.75*	<.001 (.003)	.21
C vs. F	12.51*	<.001 (.003)	.15
F vs. W	11.61*	.001 (.004)	.21
D vs. W	8.32*	.004 (.004)	.21
C vs. D	7.20	.007 (.004)	.13
B vs. C	4.16	.042 (.005)	.07
A vs. B	2.60	.107 (.005)	.05
C vs. W	1.07	.301 (.006)	.05
A vs. W	.67	.413 (.006)	.03
D vs. F	.05	.828 (.007)	.01
B vs. W	<.01	.947 (.008)	<.01

*p value ≤ alpha

Research Question 7

Is there a significant difference in student success as measured by the proportion of

students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between Pell Grant-eligible students and non-Pell Grant-eligible students based on instructional

method (online or face-to-face)?

H_07_1: There is no significant difference in student success as measured by the proportion

of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between Pell Grant-eligible students and non-Pell Grant-eligible students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success

as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or

"W" on the final course grade varied between Pell Grant-eligible students and non-Pell Grant-

eligible students for online students. The two variables were final course grade (A, B, C, D, F, or

W) and Pell Grant-eligibility status (yes or no). Pearson χ^2 (5, $N = 2{,}154$) $= 40.97$, $p < .001$,

Cramer's $V = .14$. Therefore, the null hypothesis was rejected. Table 21 indicates the percentage

of students earning each final course letter grade for online students by Pell Grant-eligibility

status.

Table 21

Percentage of Online Students Earning Each Final Course Letter Grade by Pell Grant-Eligibility Status

Pell Grant-Eligibility Status	Final Course Grade						Total
	A	B	C	D	F	W	
Yes	37.5	24.9	13.4	5.1	13.1	5.9	100.0
No	50.1	23.3	9.1	3.3	8.7	5.5	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 22 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There were four significant pairwise differences, between "A vs. C," "A vs. F," "A vs. B," and "A vs. D." No significant differences were identified between other pairs of grades. In general, Pell Grant-eligible students were significantly more likely to make a "B," "C," "D," or an "F" than an "A" on a final grade in an online course. Non-Pell Grant-eligible students were more likely to make an "A" than a "B," "C," "D," or an "F."

Table 22

Results from the Pairwise Comparisons of Final Course Grade for Online Students by Pell Grant-Eligibility Status Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
A vs. C	20.50*	<.001 (.003)	.13
A vs. F	21.55*	<.001 (.003)	.14
A vs. B	10.05*	.002 (.004)	.08
A vs. D	9.79*	.002 (.004)	.10
B vs. F	4.56	.033 (.004)	.08
B vs. C	3.97	.046 (.004)	.07
A vs. W	3.26	.071 (.005)	.06
F vs. W	2.35	.125 (.005)	.08
B vs. D	2.29	.130 (.006)	.06
C vs. W	2.01	.156 (.006)	.07
D vs. W	1.58	.209 (.007)	.09
C vs. D	.02	.883 (.008)	.01
C vs. F	.02	.883 (.008)	.01
D vs. F	<.01	.970 (.010)	<.01
B vs. W	<.01	.998 (.013)	<.01

*p value ≤ alpha

H_07_2: There is no significant difference in student success as measured by the proportion

of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between Pell Grant-eligible students and non-Pell Grant-eligible students for face-to-face students.

A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade, varied between Pell Grant-eligible students and non-Pell Grant-eligible students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and Pell Grant-eligibility status (yes or no). Pearson χ^2 (5, $N = 2{,}118$) = 10.14, $p = .071$, Cramer's $V = .07$. Therefore, the null hypothesis was retained. Table 23 indicates the percentage of students earning each final course letter grade for face-to-face students by Pell Grant-eligibility status.

Table 23

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Pell Grant-Eligibility Status

| Pell Grant-Eligibility Status | Final Course Grade | | | | | | Total |
	A	B	C	D	F	W	
Yes	35.4	26.2	17.7	6.0	11.1	3.6	100.0
No	41.3	24.9	15.9	6.3	9.0	2.6	100.0

Research Question 8

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between first-generation college students and non-first-generation college students based on instructional method (online or face-to-face)?

H_08_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade, varied between first-generation college students and non-first-generation college students for online students. The two variables were final course grade (A, B, C, D, F, or W) and first-generation college student status (yes or no). Pearson χ^2 (5, $N = 1,285$) = 7.43, $p = .191$, Cramer's $V = .08$. Therefore, the null hypothesis was retained. Table 24 indicates the percentage of students earning each final course letter grade for online students by first-generation college student status.

Table 24

Percentage of Online Students Earning Each Final Course Letter Grade by First-Generation College Student Status

First-Generation College Student Status	Final Course Grade						Total
	A	B	C	D	F	W	
Yes	40.9	23.9	13.6	5.0	10.9	5.8	100.0
No	37.6	27.1	10.2	4.8	13.6	6.6	100.0

H_08_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between first-generation college students and non-first-generation college students for face-to face students.

A two-way contingency table analysis was conducted to evaluate whether student success, as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade, varied between first-generation college students and non-first-generation college students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and first-generation college student status (yes or no). Pearson χ^2 (5, $N = 1,398) = 5.80$, $p = .326$, Cramer's $V = .06$. Therefore, the null hypothesis was retained. Table 25 indicates the percentage of students earning each final course letter grade for face-to-face students by first-generation college student status.

Table 25

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by First-Generation College Student Status

First-Generation College	Final Course Grade						Total
Student Status	A	B	C	D	F	W	
Yes	35.5	27.6	16.9	7.4	10.6	2.1	100.0
No	37.9	25.7	17.9	5.2	10.1	3.2	100.0

Research Question 9

Is there a significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students based on instructional method (online or face-to-face)?

H_09_1: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students for online students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between single students and married students for online students. The two variables were final course grade (A, B, C, D, F, or W) and marital status (single or married). Pearson χ^2 (5, $N = 2,068$) = 17.77, $p = .003$, Cramer's $V = .09$. Therefore, the null hypothesis was rejected. Table 26 indicates the percentage of students earning each final course letter grade for online students by marital status.

Table 26

Percentage of Online Students Earning Each Final Course Letter Grade by Marital Status

| Marital Status | Final Course Grade | | | | | | Total |
	A	B	C	D	F	W	
Single	41.0	24.6	12.1	4.5	12.3	5.5	100.0
Married	49.3	24.4	9.5	4.2	7.1	5.5	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 27 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. There was one significant pairwise difference, between "A vs. F." No significant differences were identified between other pairs of grades. In general, single students were significantly more likely to make an "F" than an "A" on a final grade in an online course. Married students were more likely to make an "A" than an "F."

Table 27

Results from the Pairwise Comparisons of Final Course Grade for Online Students by Marital Status Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
A vs. F	14.38*	<.001 (.003)	.11
B vs. F	6.89	.009 (.004)	.10
A vs. C	5.81	.016 (.004)	.07
F vs. W	3.78	.052 (.004)	.12
D vs. F	2.74	.098 (.005)	.09
A vs. B	2.20	.138 (.005)	.04
C vs. F	1.61	.205 (.006)	.06
B vs. C	1.54	.215 (.006)	.05
A vs. D	.80	.371 (.007)	.03
C vs. W	.79	.374 (.008)	.05
A vs. W	.64	.423 (.010)	.03
C vs. D	.45	.505 (.013)	.04
B vs. D	.02	.878 (.017)	.01
D vs. W	.02	.891 (.030)	.01
B vs. W	<.01	.987 (.050)	<.01

*p value ≤ alpha

H_09_2: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between single students and married students for face-to-face students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between single students and married students for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and marital status (single or married). Pearson χ^2 (5, N = 1,980) = 11.32, p = .045, Cramer's V = .08. Therefore, the null hypothesis was rejected. Table 28 indicates the percentage of students earning each final course letter grade for face-to-face students by marital status.

Table 28

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Marital Status

Marital Status	Final Course Grade						Total
	A	B	C	D	F	W	
Single	37.7	25.0	17.0	6.2	10.8	3.2	100.0
Married	44.5	30.0	13.0	3.5	7.0	2.0	100.0

Follow-up pairwise comparisons were conducted to evaluate specific differences among proportions of students earning each final course letter grade. Table 29 shows the results of these analyses. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the 15 comparisons conducted. No significant differences were identified between pairs of grades.

Table 29

Results from the Pairwise Comparisons of Final Course Grade for Face-to-Face Students by Marital Status Using the Holm's Sequential Bonferroni Method

Comparison	Pearson chi-square	*p* value (alpha)	Cramer's *V*
A vs. F	4.18	.041 (.003)	.07
B vs. F	4.13	.042 (.004)	.08
A vs. C	3.53	.060 (.004)	.06
B vs. D	3.53	.060 (.004)	.08
A vs. D	3.50	.061 (.004)	.06
B vs. C	3.41	.065 (.005)	.06
B vs. W	1.54	.215 (.005)	.05
A vs. W	1.49	.222 (.006)	.04
C vs. D	.49	.482 (.006)	.03
C vs. F	.24	.625 (.007)	.02
C vs. W	.13	.717 (.008)	.02
D vs. F	.09	.769 (.010)	.02
D vs. W	.03	.869 (.013)	.01
A vs. B	.01	.927 (.017)	<.01
F vs. W	<.01	.955 (.030)	<.01

*p value ≤ alpha

Research Question 10

Is there a significant difference in student success as measured by the proportion of

students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade

between students with dependent children and students without dependent children based on instructional method (online or face-to-face)?

$H_0 10_1$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children for online students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children for online students. The two variables were final course grade (A, B, C, D, F, or W) and dependent child status (yes or no). Pearson χ^2 (5, $N = 1,422$) = 3.16, $p = .675$, Cramer's $V = .05$. Therefore, the null hypothesis was retained. Table 30 indicates the percentage of students earning each final course letter grade for online students by dependent child status.

Table 30

Percentage of Online Students Earning Each Final Course Letter Grade by Dependent Child Status

Dependent Child Status	Final Course Grade						Total
	A	B	C	D	F	W	
Yes	40.5	24.3	16.2	1.4	10.8	6.8	100.0
No	38.8	25.4	12.2	5.0	12.6	5.9	100.0

$H_0 10_2$: There is no significant difference in student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade between students with dependent children and students without dependent children for face-to-face students.

A two-way contingency table analysis was conducted to evaluate whether student success as measured by the proportion of students making a letter grade of "A," "B," "C," "D," "F," or "W" on the final course grade varied between students with dependent children and students without dependent children for face-to-face students. The two variables were final course grade (A, B, C, D, F, or W) and dependent child status (yes or no). Pearson χ^2 (5, $N = 1,551$) = 5.63, p = .344, Cramer's V = .06. Therefore, the null hypothesis was retained. Table 31 indicates the percentage of students earning each final course letter grade for face-to-face students by dependent child status.

Table 31

Percentage of Face-to-Face Students Earning Each Final Course Letter Grade by Dependent Child Status

| Dependent Child Status | Final Course Grade | | | | | | Total |
	A	B	C	D	F	W	
Yes	42.1	26.3	10.5	0.0	10.5	10.5	100.0
No	36.1	26.4	17.8	6.2	10.6	2.9	100.0

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR PRACTICE AND

FURTHER RESEARCH

The purpose of this study was to determine if significant differences existed in overall student success at the community college level in online courses as compared to in traditional face-to-face courses across disciplines. In addition, the researcher investigated the relationship between each of the following factors and student success in online courses: (a) demographic (age group and gender); (b) academic (composite ACT score); (c) enrollment (student course load and student classification); and (d) external environmental (financial aid status, first-generation college student status, marital status, and dependent children status). Success was demonstrated by the final course letter grades earned by students. Final course letter grades were defined as six possible levels (A, B, C, D, F, and W).

The study involved an analysis of data relevant to students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester from fall 2012 through spring 2015 (excluding summer sessions). The target population included 4,604 students enrolled at a public 2-year community college located in southern Middle Tennessee.

Ten research questions guided the study, and 20 hypotheses were tested. A two-way analysis of variance (two-way ANOVA) was used to analyze the data associated with research question 4. A chi-square (χ^2) test of independence (two-way contingency table analysis) was used to analyze the data relevant to all other research questions.

Summary of the Findings

Table 32 shows the composition of the population with respect to the independent

research variables. In addition, the mean composite ACT score of the population was 20.69.

Table 32

Composition of Population by Independent Research Variable

Independent Variable		Percent of Population	Count
Instructional Method	Face-to-face	49.6	2,118
	Online	50.4	2,154
Age Group	Traditional-age	71.2	2,711
	Nontraditional-age	28.8	1,094
Gender	Male	34.5	1,475
	Female	65.5	2,797
Student Load	Full-time	57.1	2,427
	Part-time	42.9	1,820
Student Classification	Freshman	52.7	1,886
	Sophomore	47.3	1,695
Pell Grant Eligibility	Yes	58.4	2,493
	No	41.6	1,779
First-Generation College Student	Yes	50.3	1,350
	No	49.7	1,333
Marital Status	Single	82.8	3,353
	Married	17.2	695
Dependent Children	Yes	3.1	93
	No	96.9	2,880

From fall 2012 through spring 2015, the period from which data were collected, the

overall student population averaged: 76% traditional-aged and 24% nontraditional-aged, 61%

females and 39% males, 44% enrolled full-time and 56% enrolled part-time, and a composite

ACT score of 18.9 (TBR, 2014; THEC, 2013; THEC, 2014; THEC, 2015). In addition, 75% of traditional-aged students were eligible to receive federal Pell grants (THEC, 2013; THEC, 2014; THEC, 2015).

Overall Student Success in Online Versus Face-to-Face Courses

The results relevant to research question 1 indicated that students in online courses were significantly more likely to withdraw from a class than students in face-to-face courses. This finding was consistent with those of earlier studies (Allen & Seaman, 2015; Aragon & Johnson, 2008; Hachey et al., 2013; Harrell & Bower, 2011; Wojciechowski & Palmer, 2005; Xu & Jaggars, 2011a, 2011b). Another result from the present study was that students in an online course were significantly more likely to make an "A" or "F" final course grade, whereas those in a face-to-face course were more likely to make mid-range grades of a "B," "C," or "D."

Over 21% of students in online classes made an "A," as compared to 18.8% of students in face-to-face classes. In face-to-face classes 24.1% of students made grades in the "B," "C," or "D" range, as opposed to 20.3% of students in online classes. There was no consensus among earlier research, but indications were that online students tended to earn lower grades than face-to-face students (Capra, 2011; Helms, 2014; Scherrer, 2011; Sue, 2005; Xu & Jaggars, 2011b). The results from this study suggest the need for additional research, as they are neither clearly consistent with nor contradictory to earlier findings regarding grades.

Selected Student Success Attributes Relevant to Online Courses

Demographic. Research questions 2 and 3 concerned the relationship between the demographic factors of age group and gender, respectively, and student success in online courses. Findings showed that nontraditional students were significantly more likely to earn an "A" in an online class than traditional students. In addition, nontraditional students were more

likely to earn an "A" in a face-to-face class than traditional students. These results support findings by Wojciechowski and Palmer (2005) that younger students had poorer academic performance in online courses as compared to older students.

With respect to gender, there was no significant difference in students taking online courses. These findings support those of Park and Choi (2009). However, results also showed that females were significantly more likely to make an "A" or a "B" in a face-to-face class than males. Male students were more likely to make grades of "C," "D," or "F."

Academic. Research question 4 was concerned with the relationship between the academic factor of composite ACT scores and student success in online courses. Earlier research by Wojciechowski and Palmer (2005) found no relationship between the two, but the findings of this study suggest otherwise. A two-way ANOVA was conducted to evaluate the associations between instructional method, composite ACT scores, and student success as measured by final course letter grades. The ANOVA indicated no significant interaction, but it showed there were significant main effects for instructional method and final course grade. Students taking online classes tended to have higher composite ACT scores than students taking face-to-face classes. In addition, there appeared to be a relationship between composite ACT score and final letter grade. Students with higher composite ACT scores tended to earn higher final course grades than those with lower composite ACT scores.

Enrollment. Research questions 5 and 6 concerned the relationship between the enrollment factors of student course load and student classification, respectively, and success in online courses. Findings indicated that part-time students were significantly more likely to make a "W" than full-time students in both online courses and face-to-face courses. These results support the findings of Aragon and Johnson (2008), who observed that students who did not

complete online courses tended to be enrolled in fewer hours than those who did complete. However, Wojciechowski and Palmer (2005) reported that student load status had no significant relationship to online success.

With respect to student classification, the findings from this study showed that freshmen were significantly more likely than sophomores to make an "F" on a final course grade in both online and face-to-face classes. Also, sophomores were more likely to make a higher final course grade (i.e.; A or B) than freshmen in both online and face-to-face classes. These results support those of Dupin-Bryant (2004) and Muse (2003), who found that students with more credit-hours were more successful than those with fewer credit-hours.

External Environmental. Research questions 7, 8, 9, and 10 were associated with the external environmental factors of financial aid status (as indicated by Pell Grant-eligibility status), first-generation college student status, marital status, and dependent child status. Results of the study showed that Pell Grant-eligible students were significantly less likely to make an "A" on a final course grade in an online course than non-Pell Grant-eligible students. There was no significant difference in student success in face-to-face courses based on Pell Grant eligibility status. In addition, there was no significant difference in student success in online or face-to-face courses based on first-generation college student status. Pontes and Pontes (2012) reported that first-generation college students from low-income households experienced success when enrolled in online courses. Although that study differed from the present study in several respects, the results are contradictory and indicate that further research is needed in this area.

Additional findings of this study showed that married students were significantly more likely than single students to make an "A" on a final grade in an online course. Single students

were more likely to make an "F" final grade. There was no significant difference in student success in online or face-to-face courses based on dependent child status.

Conclusions

Of the 10 research questions associated with this study, 8 had statistically significant findings. Results indicated there was a significant difference in student success between students taking a course online and students taking the same course with the same instructor face-to-face. Also, there was a significant difference in student success based on instructional method when the following factors were considered: age group, gender, composite ACT score, student load, student classification, Pell Grant eligibility status, and marital status. There was no significant difference in student success based on instructional method when first-generation college student status or dependent child status were considered.

Students who were nontraditional-aged, sophomores, non-Pell Grant-eligible, and married tended to have success in online courses at higher rates than other students in this study. Ironically, these are the student groups who often have personal responsibilities, work obligations, and financial management issues that make attending and completing school a complicated and challenging process (Compton et al., 2006; Wyatt, 2011).

One factor that must always be considered with respect to the success of students concerns financial aid rules and regulations. Although 58.4% of students in this study were eligible to receive Pell Grants, many additional students most likely received other types of financial aid (i.e., loans, scholarships). Generally, a student must maintain full-time enrollment status to continue receiving aid. Also, they must maintain a specified minimum GPA, which varies from one type of financial aid to another. Sometimes students who are doing poorly in courses will remain in the classes and receive "F" grades, instead of dropping and having their

load status change to part-time. The effect of the "F" on the GPA may be less damaging overall in terms of keeping financial aid.

Recommendations for Practice

Implementation of the following recommendations for practice could help to improve the success of students in online courses and programs:

1. Postsecondary institutions could establish a screening tool for use in assessment of online readiness. Advisors and students could use the instrument as an aid in determining if the online instructional format is appropriate for an individual. Successful online students tend to be independent workers and critical thinkers. Also, they generally have organizational, technological, and time management skills (Wojciechowski & Palmer, 2005). Online courses are not the best educational format for all students. Screening prior to an initial online enrollment could make some students aware that they are not a good fit for that type of course and prevent unnecessary academic failure.

2. Colleges and universities could require students to attend an online orientation at the beginning of their first online course. This orientation should introduce students to the learning management system and organization used in the course; technical support available; institutional policies; library and other campus office information and resources; and links to available software and technical information needed for the course. In addition, online faculty members could include orientations within individual courses.

3. Online students tend to do coursework at nontraditional times of the day (and night). Institutions need to offer student and technical support services during evening, weekend,

and holiday hours. Although it may not be feasible to hire office staff at all of these times, campus organizations could potentially provide student volunteers.

Recommendations for Further Research

Although this was a quantitative study conducted at one community college of the Tennessee Board of Regents system, the following are recommendations for further research:

1. A similar quantitative study could be conducted that includes all 13 TBR community colleges.

2. A qualitative study that included interviews with online students could provide additional insight into the factors relevant to student success in this instructional format.

3. Because of contradictory results in studies concerning both nontraditional students and financial aid students, each of these demographic groups warrants further research relevant to their success in online courses.

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APPENDICES

APPENDIX A

Definition of Research Variables

Variable Name	Definition of Variable
Instructional Method	1 = Face-to-face 2 = Online
Final Course Grade	1 = A (Outstanding) 2 = B (Above Average) 3 = C (Average) 4 = D (Passing) 5 = F (Failing) 6 = W (Withdrew; MSCC, 2015)
Age Group	1 = Traditional-age 2 = Nontraditional-age
Gender	1 = Male 2 = Female
Composite ACT Score	Average of English, mathematics, reading, and science test scores, ranging from a low of 1 to a high of 36 (The ACT, 2016)
Student Load	1 = Full-time 2 = Part-time
Student Classification	1 = Freshman 2 = Sophomore
Pell Grant Eligibility	1 = Yes 2 = No
First-Generation College Student	1 = Yes 2 = No
Marital Status	1 = Single 2 = Married
Dependent Children	1 = Yes 2 = No

APPENDIX B

Institutional Review Board (IRB) Approval to Conduct Research

EAST TENNESSEE STATE
UNIVERSITY

Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707
Phone: (423) 439-6053 Fax: (423) 439-6060

September 23, 2015

Dear Cheri Gregory,

Thank you for recently submitting information regarding your proposed project "Student Success in Online Versus Equivalent Face-to-Face Courses".

I have reviewed the information, which includes a completed Form 129.

The determination is that this proposed activity as described meets neither the FDA nor the DHHS definition of research involving human subjects. Therefore, it does not fall under the purview of the ETSU IRB.

IRB review and approval by East Tennessee State University is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are human subject research in which the organization is engaged, please submit a new request to the IRB for a determination.

Thank you for your commitment to excellence.

Sincerely,
Stacey L. Williams, Ph.D.
Chair, ETSU IRB

Accredited Since December 2005

APPENDIX C

Participating Institution Approval to Conduct Research

From: Anthony Kinkel
Sent: Thursday, September 24, 2015 7:43 PM
To: Cheri Gregory
Cc: Cindy Logan
Subject: Re: request for permission to conduct research

Cheri

Sounds like a great study. I approve Motlow State's participation.

Dr. Tony Kinkel
President

Sent from my iPad

> On Sep 24, 2015, at 12:18 PM, "Cheri Gregory" <CGregory@mscc.edu> wrote:
>
> Dr. Kinkel,
>
> I am currently a doctoral candidate at East Tennessee State University in pursuit of an Ed.D. in Educational Leadership & Policy Analysis (Postsecondary). Monday my proposal was approved on the topic "Student Success in Online versus Equivalent Face-to-Face Courses," and yesterday I received approval from ETSU's Institutional Review Board (see attachment). I would like your permission to conduct my study at Motlow and have access to the data I need. I believe the data should already exist within the Banner database. I have attached my proposal in case you want to look at any part of it, but I have also summarized the key points at the end of this email.
>
> I have been teaching online courses at Motlow for the past 8 years, and I have developed 4 online/hybrid courses for the Natural Sciences Department. Last year I served on an Online Learning Sub-Committee with Cindy Logan and several other representatives from the Motlow community (faculty, staff, and students). Our goal was to develop suggestions for improvements to the college's online courses and programs. I have discussed my study with Cindy several times and have attempted to address many of the topics of committee concern in my research. My hope is that the results of the study will be useful to the college in improving distance education in the future.
>
> The purpose of this study is to determine if significant differences exist in overall student success at the community college level in online courses as compared to in face-to-face courses taught by the same instructor and across disciplines. In addition, the researcher will investigate the relationship between each of the following attributes and student success in online courses: (a) demographic (age, race, and gender); (b) academic (grade point average [GPA] and composite ACT score); (c) enrollment (course load status, number of course withdrawals, student classification, student online course enrollment history, and program of study/major); and (d) external environmental (financial aid status, employment status, first-generation college student status, marital status, and number of dependent children).
>
> The target population includes all students enrolled in course sections taught by instructors who taught both online and face-to-face sections of the same course within the same semester from fall 2012 through spring 2015 (excluding summer sessions). The researcher's intent is to compare student success in online versus face-to-face courses in which as many conditions as possible were equal (i.e., same instructor, same course syllabus, same or similar assignments and assessments) so the variables in the study could be tested.
>
> Cheri Gregory
> Associate Professor of Biology
> Motlow State Community College
> (931)393-1721

VITA

CHERI BUCHANAN GREGORY

Education: Ed.D. Educational Leadership
                                    East Tennessee State University, 2016
                                    Johnson City, Tennessee
                             M.S. Biology
                                    Middle Tennessee State University, 1987
                                    Murfreesboro, Tennessee
                             B.S. Biology
                                    Middle Tennessee State University, 1984
                                    Murfreesboro, Tennessee
                             A.S. University Parallel
                                    Motlow State Community College, 1982
                                    Lynchburg, Tennessee

Professional Experience: Motlow State Community College, 1988-present
                                    Lynchburg, Tennessee
                                            Associate Professor, Biology, 2005-present
                                            Department Chair, Natural Sciences, 2009-2012
                                            Assistant Professor, Biology, 2001-2005
                                            Instructor, Biology, 1995-1997 and 1998-2001
                                            Adjunct Biology Instructor, 1988-1995, 1997-1998
                             Shelbyville Central High School, 1987-1988
                                    Shelbyville, Tennessee
                                            Biology and Chemistry Instructor
                             Middle Tennessee State University, 1986-1987
                                    Murfreesboro, Tennessee
                                            Graduate Teaching Assistant, Biology
                             West Middle School, 1985-1986
                                    Tullahoma, Tennessee
                                            Life Science Instructor
                             Coffee County Central High School, 1984-1985
                                    Manchester, Tennessee
                                            General Biology, Zoology, and Botany Instructor

Honors and Awards: Motlow State Community College Foundation Faculty Excellence
                                    Award, 2005
                             Motlow State Community College Foundation Faculty Excellence
                                    Award Nominee; 2004, 2009, and 2014
                             National Institute for Staff & Organizational Development
                                    (NISOD) Teaching Excellence Award, 2005
                             Who's Who Among America's Teachers
                             Who's Who of American Women