

ONLINE CREDIT RECOVERY AS AN EFFECTIVE INTERVENTION FOR AMERICAN
STUDENTS AT RISK OF DROPPING OUT OF HIGH SCHOOL

Jesse T. Boyd

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Carol S. Cash, Chair
Ted S. Price
Greg J. Smith
Travis W. Twiford

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ABSTRACT

The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on a student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses. Every school year, over 1.2 million students drop out of high school in the United States (National Center for Educational Statistics, 2001). One in four African American students and nearly one in five Hispanic students attend high schools where graduating is not the norm (United States Department of Education, 2013). Poor students (bottom 20 percent of all family incomes) are five times more likely to drop out of high school than high-income students (top 20 percent of all family incomes) (Chapman, Laird, Ifill, & KewalRamani, 2011). On average, 72 percent of male students earn a diploma compared with 78 percent of female students, a gender gap of 6 percentage points that has remained virtually unchanged for years (Education Week, 2013). Research has shown that students who miss or fail academic courses are at greater risk of dropping out of school than their peers. To re-engage these students researchers recommend that schools provide extra academic support (Dynarski, Clarke, Cobb, Finn, Rumberger, & Smink, 2008). Extra academic support has most recently come in the form of online credit recovery. The results of this study showed that online credit recovery is an effective instructional method for students in need of recovering lost core and elective credits. The results showed that females outperformed male students, and more affluent students recorded a higher pass rate than less

fortunate students. Hispanic and Black students received a passing grade at a rate comparable to White students. Results varied depending on the course a student took. Instructional leaders, who are dedicated to the promotion of student learning and the quality of instruction, should consider it a priority to recognize the emerging trends in dropout prevention and to assess the effectiveness of online credit recovery programs.

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Chapter One: Introduction

Background of the Problem

“This is a problem we can’t afford to accept or ignore. The stakes are too high – for our children, for our economy, for our country. It’s time for all of us to come together – parents and students, principals and teachers, business leaders and elected officials – to end America’s dropout crisis” (Obama, 2010, pp. 1). Students in the United States are leaving school without a diploma at a high rate. Every school year, over 1.2 million students drop out of high school in the United States alone. That’s a student every 26 seconds – or 7,000 a day (National Center for Educational Statistics, 2001). The increasingly high number of students not completing high school is a major concern when considering the future welfare of our country. The United States which had some of the highest graduation rates of any developed country, now ranks 22nd out of 27 developed countries (Organization for Economic Cooperation and Development, 2012).

The consequences associated with dropping out of school go well beyond the individual; society as a whole pays the price. Dropouts are three and a half times more likely than high school graduates to be arrested and more than eight times as likely to be in jail or prison (Bridgeland, 2007). Comparing those who drop out of high school with those who complete high school, the average high school dropout costs the economy approximately \$240,000 over his or her lifetime in terms of lower tax contributions, higher reliance on Medicaid and Medicare, higher rates of criminal activity, and higher reliance on welfare (Levin & Belfield, 2009).

Trends that further complicate the issue have emerged as the dropout problem continues to be researched. Nearly 80 percent of the nation’s high schools that produce the highest number of dropouts can be found in just 15 states (Balfanz & Legters, 2004). One in four African

American students and nearly one in five Hispanic students attend high schools where graduating is not the norm (United States Department of Education, 2013). Poor students (bottom 20 percent of all family incomes) are five times more likely to drop out of high school than high-income students (top 20 percent of all family incomes) (Chapman, Laird, Ifill, & KewalRamani, 2011). On average, 72 percent of male students earn a diploma compared with 78 percent of female students, a gender gap of six percentage points that has remained virtually unchanged for years (Education Week, 2013). Geographic location, ethnicity, socio-economic statuses, and gender, are only a few of the variables that make the dropout problem extremely difficult to combat.

Federal efforts to deal with the issue have most recently peaked with the reauthorization of the Elementary and Secondary Education Act of 1965. With a new name came many new expectations. Now referred to as the No Child Left Behind Act of 2001, it created a new era of accountability that considered student achievement, evidenced through end-of-course assessments and school graduation rates, as indicators of a school's success. The No Child Left Behind Act placed emphasis on schools using scientifically-based strategies and programs to address any deficiencies in their instructional programming. President Obama's Blueprint for Reform (2010) supports No Child Left Behind graduation requirements, but emphasized the need for innovative solutions to facilitate these demands.

Research has shown that students who miss or fail academic courses are at greater risk of dropping out of school than their peers. To re-engage these students researchers recommend that schools provide extra academic support (Dynarski, Clarke, Cobb, Finn, Rumberger, & Smink, 2008). Extra academic support has most recently come in the form of credit recovery. Credit recovery is a method of allowing students to retake course work with the opportunity to pass and

receive credit for a course they previously attempted but were unsuccessful (Center for Public Education, 2012). Online credit recovery is an innovative solution designed to allow students struggling to meet graduation requirements to regain lost credits through completing coursework online. If students have not been successful in a traditional classroom setting, online credit recovery providers offer an alternative way of acquiring credits towards graduation. Online credit recovery courses are self-contained, independent study units designed to supplement the school's existing curriculum and give students a chance to earn credit in subjects they previously failed (Keystone, 2014). Online credit recovery programs are increasingly prevalent due to the pressure felt by school districts to improve graduation rates through the No Child Left Behind Act coupled with the increase in educational technology in schools and the growth in providers of online course content aligned with state education standards (D'Agustino, 2013).

Online credit recovery programs have the potential to increase the engagement and achievement of students at risk of dropping out of high school through technological interaction, personalization, and immediate feedback (Biesinger & Crippen, 2008; Watson & Gemin, 2008). If online credit recovery may potentially help students at risk of not graduating in acquiring credits and ultimately graduating from high school, then it is important that research continues on the effectiveness of these programs. Instructional leaders, who are dedicated to the promotion of student learning and the quality of instruction, should consider it a priority to recognize the emerging trends in dropout prevention and to assess the effectiveness of online credit recovery programs.

Statement of the Problem

Online credit recovery programs have increased in popularity because of the “push to raise graduation rates by many groups representing leaders from business, higher education, and

state and local government” (Education Week, 2008, pp. 1). Research on this rapid expansion in the use of online credit recovery programs has only just begun. Although research involving online learning has explored various purposes and populations, there is still a dearth of research involving online learning with the specific purpose of credit recovery for at-risk learners (Stillwell, R. & Hoffman, R. 2008). Success stories and anecdotes regarding the benefits and value of online learning for both at-risk students and the schools serving them abound. The need exists for federal funding of quantitative research in this area (Watson & Gemin, 2008). Little research into the effectiveness of K-12 online learning has been published, and there is a need to evaluate the quality of lower-performing student’s virtual learning experiences (Cavanaugh, C. S., Barbour, M. K., & Clark, T., 2009; Means, Toyama, Murphy Bakia, & Jones, 2009).

As the number of students not completing high school continues to be a challenge, as federal pressure intensifies on schools to increase graduation rates, and as society indirectly feels the ill effects of more and more dropouts it is imperative that all potential solutions to this issue be fully researched. Currently a gap exists between the use of online credit recovery and empirical data on the effectiveness of this intervention for students at risk of dropping out. The surge of interest in online credit recovery programs has come despite scant research on the programs’ effectiveness (Zehr, 2010). The growth in the use of online credit recovery across the United States should provide an alarming sign that researchers and practitioners need more than anecdotal evidence to make informed decisions. It is imperative that instructional leaders have the information needed to effectively evaluate online credit recovery in order to determine the positive and negative impact on students at risk of not graduating.

Purpose of the Study

The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses.

The study used a comparative design to examine if differences exist between student demographic factors and the degree of success in accruing credits toward graduation through online credit recovery courses. The relationship between student demographic factors and online credit recovery were explored to determine whether online learning for the purposes of credit recovery is a viable option for students at risk of dropping out of high school. There is a real dearth of research on credit recovery; even basic questions are unanswered (Carr, 2014). This study can influence future instructional design and development of online credit recovery initiatives by accessing pass rates related to certain student demographic factors, such as gender, socio-economic status, race/ethnicity, and course. This study can help to inform instructional leaders in making research-driven decisions related to students and online credit recovery.

Conceptual Framework

Poor academic performance is one of the most telling factors for a student dropping out of school (Rumberger, 2004). The conceptual framework for this study suggests that when a student performs poorly in a course the potential result is unsatisfactory mastery of foundational skills and the student has to repeat the course. Having to repeat a course causes the student to lag behind his/her peers in credit accumulation and have difficulty in higher-level courses that require the skills missed in prerequisite courses. Ultimately this process may result in a student

dropping out of high school as seen in the top portion of Figure 1 below. This study proposes that a student who exhibits poor academic performance may reengage in their studies through online credit recovery for reasons that are later discussed. When students are offered a means to reengage they accumulate credits at a rate comparable to their peers and they acquire the needed foundational skills to succeed in advanced-level courses. In the end, as referenced in the bottom portion of Figure 1, the potential result is that students have a greater chance of graduating from high school on time with their peers.

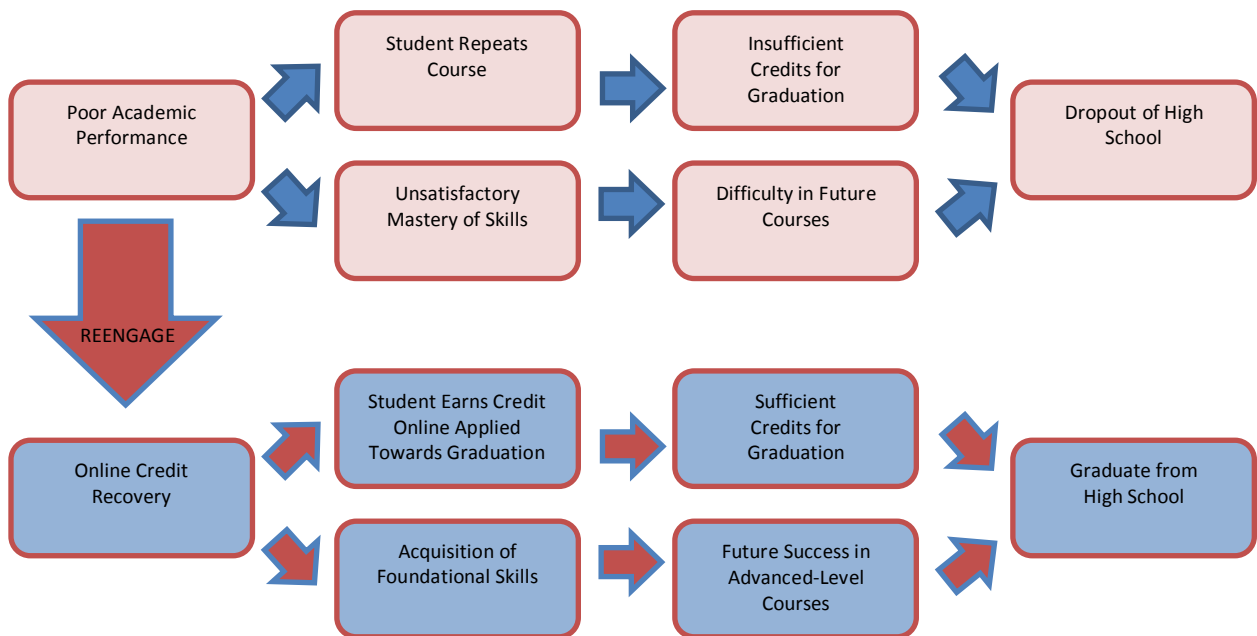


Figure 1. Conceptual Framework

Research Questions

The research questions that form the basis for accomplishing the purpose and to guide this quantitative study were:

1. What percent of students who enroll in an online credit recovery core course regain lost credits?

2. What difference is there in the student's final grade in an online credit recovery core course based on student gender?
3. What difference is there in the student's final grade in an online credit recovery core course based on student socio-economic status?
4. What difference is there in the student's final grade in an online credit recovery core course based on student race/ethnicity?
5. What difference is there in the student's final grade in an online credit recovery core course based on course taken?
6. What percent of students who enroll in an online credit recovery elective course regain lost credits?
7. What difference is there in the student's final grade in an online credit recovery elective course based on student gender?
8. What difference is there in the student's final grade in an online credit recovery elective course based on student socio-economic status?
9. What difference is there in the student's final grade in an online credit recovery elective course based on student race/ethnicity?
10. What difference is there in the student's final grade in an online credit recovery elective course based on course taken?

Nul and Alternative Hypotheses

The following hypotheses contribute to the growing body of research on the effectiveness of online credit recovery for students at risk of dropping out:

Hypothesis 1.

H₀1: Online credit recovery has no effect on students in the recovery of lost credits in core courses.

H_a1: Online credit recovery has an effect on students in the recovery of lost credits in core courses.

Hypothesis 2.

H₀2: There is no difference between the student's final grade in an online credit recovery core course based on the student gender.

H_a2: There is a difference between the student's final grade in an online credit recovery core course based on the student gender.

Hypothesis 3.

H₀3: There is no difference between the student's final grade in an online credit recovery core course based on the student socio-economic status.

H_a3: There is a difference between the student's final grade in an online credit recovery core course based on the student socio-economic status.

Hypothesis 4.

H₀4: There is no difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity.

H_a4: There is a difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity.

Hypothesis 5.

H₀5: There is no difference between the student's final grade in an online credit recovery core course based on the course taken.

H_a5: There is a difference between the student's final grade in an online credit recovery core course based on the course taken.

Hypothesis 6.

H₀6: Online credit recovery has no effect on students in the recovery of lost credits in elective courses?

H_a6: Online credit recovery has an effect on students in the recovery of lost credits in elective courses?

Hypothesis 7.

H₀7: There is no difference between the student's final grade in an online credit recovery elective course based on the student gender.

H_a7: There is a difference between the student's final grade in an online credit recovery elective course based on the student gender.

Hypothesis 8.

H₀8: There is no difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status.

H_a8: There is a difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status.

Hypothesis 9.

H₀9: There is no difference between the student's final grade in an online credit recovery elective course based on the student race/ethnicity.

H_a9: There is a difference between the student's final grade in an online credit recovery elective course based on the student race/ethnicity.

Hypothesis 10.

H₀10: There is no difference between the student's final grade in an online credit recovery elective course based on the course taken.

H_a10: There is a difference between the student's final grade in an online credit recovery elective course based on the course taken.

Significance of the Study

The high school graduation rate is a barometer of the health of American society and the skill level of its future workforce (Heckman & LaFontaine, 2007). Throughout the first half of the 20th century, each new cohort of Americans was more likely to graduate from high school than the preceding one. This upward trend in secondary education increased worker productivity and fueled American economic growth (Aaronson & Sullivan, 2001; DeLong, Katz, & Goldin, 2003). The rate for United States students graduating from high school reached 78 percent in 2010, the highest since 1970 (Cuban, 2013). However, according to Bridgeland (2006), the nation's current graduation rate suggests that 1.2 million students leave school without a high school diploma each school year. This many young people dropping out of school annually may have an effect on American society and the nation's economy.

Dropping out of high school has an obvious adverse impact on the individual; in addition, the entire community is impacted by a young person leaving school without a diploma (Rumberger, 2004). Bridgeland (2006) asserted that dropouts have an increased chance of being unemployed, having health problems, living in poverty, receiving government assistance, and becoming single parents with children who also drop out of high school. Lower local, state, and federal tax revenues are perhaps the most obvious societal and economic consequence of higher dropout rates; even when dropouts are employed, they earn significantly lower wages than

graduates (Alliance for Excellent Education, 2007). An individual's decision to leave school without a diploma directly affects his or her standard of living and this decision indirectly affects society as a whole.

In the current era of accountability in public education the high school graduation rate is a predictor of a school's success (National Education Association, 2008). No Child Left Behind raised the stakes for graduation rates nationwide by requiring states to develop single statewide accountability systems that require districts to report secondary student graduation rates (Bridgeland, 2006). Given these new demands, school divisions have recognized the need for improved means for students to acquire the needed credits to graduate on time.

Traditional credit recovery practices, such as summer school, have been used as a means of meeting graduation requirements; however the barriers associated with accessing these programs have made instructional leaders explore other options. Online credit recovery may potentially remove many of the barriers students meet with traditional credit recovery options and for this reason it may become a successful alternative method to educating students at risk of dropping out. As more school districts across the country begin to implement online credit recovery programs research is needed to establish how students at risk of dropping out perform in an online credit recovery environment.

Methodology

This quantitative study used a comparative design to determine if differences exist between success in online credit recovery core courses and student's gender, socio-economic status, race/ethnicity, and course taken. This study also evaluated if differences exist between success in online credit recovery elective courses and student's gender, socio-economic status, race/ethnicity, and course taken. An ex post facto non-experimental approach was used because

the data analysis did not require the researcher to manipulate variables and the analysis was completed through the use of pre-existing data. Data were acquired from an online content provider that specializes in online credit recovery. The researcher examined the differences that exist between certain student demographic factors and the student's ability to perform successfully in an online credit recovery core course and an online credit recovery elective course. This study analyzed 41,435 students throughout the United States that took a course for the purposes of credit recovery during the 2012-2013 school year. This design revealed the degree to which gender, socio-economic status, race/ethnicity, and course taken play in successful completion of an online credit recovery core course and an online credit recovery elective course. The relationship between student demographic factors and the student's online credit recovery final grade should be indicative for instructional leaders as they initiate online credit recovery programs and as they determine which students are suited for this instructional method.

Definitions of Key Terms

Academic Discipline: A branch of knowledge that is taught and researched as part of higher education (US Department of Education Institute of Education Sciences, 2014). For this study core courses will be recognized in four academic disciplines: English, Mathematics, Science, and History and Social Science. Elective courses are recorded in the following disciplines: Career Technical Education, English, Fine Arts, History and Social Sciences, Life and Career Planning, Mathematics, Physical Education, and World Languages.

At-risk: A student who, due to one or more factors, have a probability of not graduating from high school.

Cohort: Group of students who enter high school in the ninth grade and continue to graduate on time four years later (VDOE, 2014).

Core course: A core course must be an academic course that receives high school graduation credit in the following areas: English, mathematics, natural/physical science; social science (National Collegiate Athletic Association). Specifically core courses for this study are Literary Analysis and Composition 9, Literary Analysis and Composition 10, American Literature 11, British and World Literature 12, Pre-Algebra, Algebra 1, Geometry, Algebra 2, Calculus, Earth Science, Biology, Physical Science, Chemistry, Geography and World Cultures, World History, Modern World Studies, U.S. History, and U.S. Government and Politics.

Credit recovery: Any educational program with the central intent of assisting students in finishing classes and gaining credits toward graduation (Watson & Gemin, 2008).

Dropout: A student who left school between the beginning of one year and the following year without earning a diploma or taking an equivalency test degree (National Center for Education Statistics, 2001).

Economically disadvantaged: A student is economically disadvantaged if they meet one of the following criteria: is eligible for Free/Reduced Meals, receives TANF, or is eligible for Medicaid (VDOE, 2014).

Elective course: Course chosen by the student, not compulsory. Elective courses for this study were Accounting, Career Planning, Civics, Consumer Math, Contemporary World Issues, Creative Writing, Drivers Safety, Economics, Family and Consumer Science, German, Health, Integrated Math, Japanese, Life Skills, Music Appreciation, Nutrition and Wellness, Personal Finance, Physical Education, Programming, Psychology, Sociology, Spanish, and Web Design.

Free lunch eligible: Children from families with incomes at or below 130 percent of the poverty level are eligible for free meals (VDOE, 2014).

High school diploma: signifies that the bearer has met proficiency standards established by the Board of Education in reading, writing, mathematics, science and history (VDOE,2014).

No Child Left Behind: The United States Act of Congress that is a reauthorization of the Elementary and Secondary Education Act, which included Title I, the government's flagship aid program for disadvantaged students (NCLB, 2002).

Online learning: Sometimes referred to as e-learning, is a form of distance education where content is delivered over the Internet and can be accessed from a computer with a network connection (Wicks, 2010).

Race/ethnicity: The United States Office of Management and Budget recognizes five minimum categories for data on race: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White. There are two categories for data on ethnicity: Hispanic or Latino and Not Hispanic or Latino (Office of Management and Budget, 1997).

Reduced lunch eligible: Children between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals, for which students can be charged no more than 40 cents for lunch and 30 cents for breakfast (VDOE, 2014).

Traditional classroom: instructional method that starts with the assumption that a predetermined number of students all learn the same thing at the same time from the same person in the same way in the same place for a predetermined number of hours each day (Dynarski et. al., 2008).

Virginia on-time graduation rate: equals [on-time graduates in year x] divided by [(first-time entering 9th graders in year x minus 4) plus (transfers in) minus (transfers out)] (VDOE, 2014)

Limitations

The researcher acknowledges that the following limitations were evident in this research study:

It is recognized that this study revealed relationships that exist between gender, socio-economic status, race/ethnicity or course taken and success or failure in an online credit recovery course. This study did not allow the researcher to determine causality. Comparative studies can measure the relationship between variables; however, it should be made clear that this study cannot determine how a phenomenon is caused (Creswell, 2009). This study only uncovered a relationship; it did not provide a conclusion for why there is a relationship.

Limitations involving the sample of students exist. All students took courses from the same online content provider. Generalizing findings to other student populations poses a risk as the students selected for the online credit recovery program in this study were selected for reasons determined by the online content provider. Furthermore, a larger more representative sample from multiple providers would offer more insight into the relationship between student demographic factors and success in recovering credits online.

Limitations involving the timing of the study exist. All data used for this study represented students taken credit recovery courses during the 2012-2013 school year. Making generalizations that encompass multiple school years is not possible. A longitudinal study that looks at multiple school years would offer more insight into the comparisons between student demographic factors and success rates in online credit recovery courses.

This study provided an analysis of the effectiveness of online credit recovery for students at risk of dropping out of high school; however, it did not provide comparable information between the traditional classroom setting and the online environment. In other words, this study did not provide information on the differences between these different instructional settings.

Chapter One Summary

“This is a problem we can’t afford to accept or ignore. The stakes are too high – for our children, for our economy, for our country. It’s time for all of us to come together – parents and students, principals and teachers, business leaders and elected officials – to end America’s dropout crisis” (Obama, 2010, pp. 1). The issue of high school dropouts has been recognized and determined to be a detriment to the individual, their community, and the entire country by the President of the United States as well as many other policymakers and practitioners.

Online credit recovery may be an innovative solution designed for students at risk of leaving school without a diploma and struggling to meet graduation requirements. Credit recovery is a method of allowing students to retake course work with the opportunity to pass and receive credit for a course they previously attempted but were unsuccessful (Center for Public Education, 2012). More empirical study is needed to determine the effectiveness of online credit recovery for students at risk of dropping out of high school (Luopa, 2010). This study added to the emerging findings on the effectiveness of online credit recovery for students at risk of dropping out. This study also aids instructional leaders who are dedicated to the promotion of student learning and the quality of innovative instruction methods.

Organization of the Study

Chapter one presented the background and statement of the problem, the purpose of the study, conceptual framework, research questions, hypotheses, study’s significance, methodology,

definitions, and limitations. Chapter two reviews the relevant literature related to the study. This chapter begins with a historical perspective of high school dropouts and concludes with a clear justification for this study. Chapter two explains the dropout crisis, consequences associated with dropping out, and dropout causes and predictors. Characteristics of effective dropout prevention programs, credit recovery, and online credit recovery are reviewed for this study. The chapter reviews the growth of online learning in public education, specifically in the researcher's home state, Virginia. The chapter concludes with an explanation of the benefits and disadvantages of online credit recovery programs. Chapter three outlines the research design, the research questions and associated hypotheses used in the study. The procedures for data collection and data analysis were also reviewed in chapter three. Chapter four presents a demographic profile of the study sample and the statistical results of each of the ten research questions. Finally, chapter five discusses the findings and implications of the study. Chapter five concludes with considerations for future research and reflections.

Chapter Two: Literature Review

Structure of the Literature Review

The literature review provides a collection of research that explains the issues associated with dropping out of high school and considers research suggesting online credit recovery as a means to getting at-risk students back on tracks for graduation. A historical perspective of the high school dropout issue is considered beginning in the early 1960's, when the establishment of high school graduation became the norm and the evolving labor market demanded qualified workers. The literature review continues by defining the dropout crisis in American public schools. This section reveals the demographic makeup of the dropout from their characteristics to their geographic locations. The review then explains the societal consequences associated with high school dropouts. Circumstances that cause students to drop out are evaluated and considered. The literature review then narrows its focus to take into account characteristics of effective dropout prevention programs. Literature pertaining to online credit recovery and the growth of online learning in public education are reviewed. The chapter concludes with an explanation of the benefits and disadvantages of online credit recovery.

Outside of a few timeless and landmark publications, only literature from 2001 until the present are reviewed. A variety of databases were used to search for studies pertaining to high school dropouts and online credit recovery as a viable means of dropout prevention. The databases are ERIC from ProQuest, Education Research Complete from EBSCOhost, and the National Center for Educational Statistics from the United States Department of Education. The search terms that were useful in locating studies were: dropout, at-risk students, dropout prevention programs, credit recovery, and online learning.

Introduction

The U.S. Department of Education National Center for Education Statistics recently reported that the 2010 national status dropout rate was 7.4 percent. For all the students who graduated from high school in the United States, a proportionate percentage of the whole failed to complete high school. On average, it was possible for high school dropouts to find a job at a living wage up until the early 1980's. A generation ago, high school dropouts could still join the military, or get work on assembly lines, and had a fair chance of finding their way in the world (Colvin, 2010). In recent years, the progression of globalization has spurred competition and advances in technology have demanded a highly skilled workforce. Lee Weiss, Executive Director of Kaplan Test Prep, remarks, "In today's competitive, global work environment, having a high school diploma or equivalent is an employment imperative for individuals, and having a high school-educated population is an imperative for our economy to thrive" (Weiss, 2013, pp.2).

In the current era of accountability in public education the high school graduation rate is a predictor of a school's success. No Child Left Behind requires that each state use the graduation rate as an indicator for a high school's success. States have recognized the need for alternative credit recovery programs and are now beginning to respond accordingly. According to a recent report, 45 states now have a state-led virtual school or online initiative, a full-time online school, or both (Watson, 2009).

Traditional credit recovery practices, such as summer school, have been used for decades as a means of meeting graduation requirements. Online credit recovery has become an alternative method to educating students at risk of dropping out. As more school districts across the country begin to implement online credit recovery programs research is needed to establish

how at-risk students perform in an online credit recovery environment. Researchers have explored the status of online courses and the growth of virtual education in the public school system (Means, Toyama, Murphy, Bakia & Jones 2009; Watson & Gemin, 2009) but little emphasis has been placed on the effectiveness of online credit recovery with students at risk of dropping out of high school. The need for empirical research is increasing as the demand for online credit recovery grows.

Historical Perspective of High School Dropouts

Attrition in American schools during the first half of the twentieth century was considered unfortunate but was accepted as commonplace (Tyack, 1974). It wasn't until the early 1960's, when the establishment of high school graduation became the standard and the evolving labor market demanded qualified workers, that the term dropout was negatively construed. Employers increasingly used graduation as a method of screening potential employees as the substance and average length of a secondary education had come to entail more than the requirements of the job (Dorn, 1996).

Discussions over civil rights, child labor laws, and a need for a qualified workforce helped frame the dropout issue in the 1960's as a societal problem affecting the individual and the country as a whole. Notable educators during the time, such as James B. Conant, president of Harvard University, wrote, "a youth who dropped out of school and never has had a full-time job is not likely to become a constructive citizen of his community...as a frustrated individual he is likely to be antisocial and rebellious, and may well become a juvenile delinquent" (Conant, 1961, pp.35).

On April 9, 1965 Congress, with the support of President Lyndon B. Johnson, passed the Elementary and Secondary Education Act (ESEA, 1965). As a former teacher, President

Johnson believed that equal access to education was a vital part of an individual's success in life. This legislation was designed specifically to provide federal funding to aid poor schools and low achieving students. Although this measure was considered the most extensive federal education bill passed to date, there was no mention in its fifty-seven pages of the term dropout, and graduation was only mentioned once in reference to admittance to institutions of higher education. There was a provision in the law that required comprehensive guidance and counseling, remedial instruction, school health services, physical education, recreation, and psychological, social work services designed to enable and encourage persons to enter, remain in, or reenter educational programs (ESEA, 1965). This is the only reference in the original authorization of the Elementary and Secondary Education Act that references the issue of dropouts.

A Nation at Risk, considered a catalyst for educational reform in the United States, failed to mention the issue of school dropouts' altogether (USDOE, 1983). In 1983 President Reagan's National Commission on Excellence in Education, led by David Pierpont Gardner, concluded that education in the United States was a long way from excellent. Some of the findings included the fact that 23 million adults in the United States were functionally illiterate while functional illiteracy for minority youth went as high as 40 percent (Luopa, 2010). This report challenged the basic premise that each generation of Americans had outstripped its parent's generation in education, in literacy, and in economic attainment. At the time of publication the report read, "for the first time in the history of our country, the educational skills of one generation will not surpass, will not equal, will not even approach, those of their parents" (United States Department of Education, 1983, pp.11). The Commission listed a series of indicators or observations that highlighted the poor state of American education. International

student assessments in math and reading, functional literacy tests, and scholastic aptitude tests were a few of the tools used to reveal the declining state of American education. Although the report mentioned many facts pertaining to the state of American education, the report did not reveal the extent of the dropout problem in American schools. Heckman and LaFontaine (2007) believe that the varying data sources, definitions, and methods used to calculate the U.S. graduation rate in prior years created an astonishingly wide range of values difficult to report.

In 1987 the Southern Regional Education Board in Atlanta, Georgia released High Schools that Work. Dr. Gene Bottoms, a former vocational teacher, toured the country to learn what promoted academic achievement, what motivated students to stay in school, and what helped kids learn (Bottoms, Han, & Presson, 2006). This large-scale effort to engage policymakers and teachers in partnerships with local communities was initiated to improve the way all high school students are prepared for work and further education. The report concluded that *career-bound* students, 60-65 percent of high school youths, needed to improve skills in communication, mathematics, science, technology, and problem-solving (Frome, 2001). The cornerstone of this research centered on the 10 Key Practices listed below:

- (1) High expectations: Integrating high expectations into classroom practices
- (2) Program of study: Require students to complete an upgraded academic concentration
- (3) Academic studies: encourage students to apply academic content to real-world problems
- (4) Career/technical studies: Provide intellectually challenging career/technical studies
- (5) Work-based learning: Enable students to choose from programs that integrate challenging high school studies and work-based learning.
- (6) Teachers working together: Provide cross-disciplinary teams of teachers and support to work together to help students succeed.

- (7) Students actively engaged: Engage students in rigorous and challenging assignments using research-based instructional strategies and technology.
- (8) Guidance: Develop positive relationships and ensure completion of an accelerated program of study with an academic or career/technical concentration.
- (9) Extra help: Provide a structured system of extra help to assist students in completing accelerated programs of study with high-level academic and technical content.
- (10) Culture of continuous improvement: Use data continually to improve school culture, organization, management, curriculum and instruction to advance student learning (Frome, 2001, pp. 4).

Bottoms was one of the first to recognize, on such a large scale, that certain modifications needed to be made to American education to ensure students graduated and were successful after graduation. High Schools That Work began with 28 pilot schools in the late 80's and has now swelled to 1200 sites in 30 states today (Southern Regional Education Board, 2009).

The Elementary and Secondary Education Act was reauthorized in 2001 and renamed the No Child Left Behind Act. This reauthorization ushered in an era of accountability in American public education. The law increased the testing requirements and set accountability standards for schools, districts, and states, including the setting of measurable adequate yearly progress objectives for all students. The primary purpose of this legislation was to use student academic assessments to hold schools accountable. A secondary performance indicator, a school's graduation rate, was added to make sure a school's progress wasn't inaccurately measured by an increase in the number of students dropping out of school. This error would occur when lower performing students drop out of school and thus never take the assessments used to hold schools accountable. When the higher performing students test and the lower

performing students leave school, the school's accountability measures are inaccurately inflated. For this reason No Child Left Behind helped standardize and quantify measures of dropouts and high school graduates. The United States Department of Education uses the four-year adjusted cohort graduation rate. The high school graduation rate can be calculated by dividing the number of diplomas issued in a given year by the number of students entering ninth grade four years earlier (NCLB, 2008).

On May 9th 2007, the nation's governors, policymakers, business leaders, and many others convened in Washington D.C. to discuss the dropout crisis in the United States. The National Summit on America's Silent Epidemic brought experts and innovators together with elected officials, policymakers, educators and students to identify concrete steps for local, state and federal policymakers to help more students finish high school prepared for college and/or the workforce (Bridgeland, 2007). The summit produced a publication titled, *Ending the Silent Epidemic: A Blueprint to Address America's High School Dropout Crisis*. The document explained the dropout issue and included a 10-point action plan to address it. The 10-point action plan recommendations were as follows:

- (1) support accurate graduation and dropout data,
- (2) establish early warning systems to support struggling students,
- (3) provide adult advocates and student supports,
- (4) support parent engagement and individualized graduation plans,
- (5) establish a rigorous college and work preparatory curriculum for high school graduation,
- (6) provide supportive options for struggling students to meet rigorous expectations,
- (7) raise compulsory school age requirements under state laws,

- (8) expand college-level learning opportunities in high school,
- (9) focus the research and disseminate best practices, and
- (10) make increasing high school graduation and college and workforce readiness a national priority (Balfanz, 2009, pp. 44).

The recommendations found in the action plan were just one of the breakthroughs made in 2007 at the Summit on America's Silent Epidemic. Another accomplishment as a result of this collaborative effort was all governors created a common definition of high school graduation rates, later improved and adopted by the U.S. Department of Education, to chart our progress and challenges across schools and states (Balfanz, Bridgeland, Moore & Fox, 2010). Now all public school divisions in the United States would use the same standard metric to determine the number of students dropping out of school.

Twenty-five years after *A Nation at Risk*, The United States Department of Education released *A Nation Accountable*. In 2008, this report read, "We remain a nation at risk but are also now a nation informed, a nation accountable, and a nation that recognizes there is much work to be done" (United States Department of Education, 2008, pp.1). The report revealed data stating for every 20 children born in 1983, six did not graduate from high school in 2001. Of the 14 who did, 10 started college that fall, but only five earned a bachelor's degree by the spring of 2007 (United States Department of Education, 2008). The report sited students dropping out of school as a remaining challenge in educational reform. More specifically, some studies estimated that 50 percent of minority students drop out of school (Balfanz & Legters, 2006; Bridgeland, 2006; Alliance for Excellent Education, 2007). The dropout problem, according to the report, was also concentrated on particular urban settings. About 12 percent of America's schools accounted for approximately half of the students who left school before graduation.

These schools, termed, *dropout factories*, had less than 60 percent of incoming freshmen reach their senior years. This report concluded with a section titled, Looking Ahead, which highlighted effective practices that were used to address the challenges in education. The United States Department of Education reported on the state of education, “While we are finally capable of defining our difficulties, the full solutions to some of them have not yet been found” (United States Department of Education, 2008, p.14).

As an initiative of the U.S. Department of Education’s Institute of Education Sciences (IES), the What Works Clearinghouse (WWC) was created in 2002 to be a central and trusted source of scientific evidence for what works in education. In September of 2008, the WWC released the IES Practice Guide, What Works Clearinghouse: Dropout Prevention. This guide, developed by a panel of educational researchers and chaired by Dynarski, was intended to provide specific recommendations for dropout prevention and indicate the quality of evidence that supported these recommendations. The third of six recommendations was to provide academic support and enrichment to improve academic performance. In order to carry out this recommendation it was suggested that schools provide extra study time and opportunities for credit recovery and accumulation. Students who fail to pass required courses need support to catch up on both academic skills and credit accumulation (Dynarski, 2008).

In June of 2008, the North American Council for Online Learning released a series titled, Promising Practices in Online Learning. One of the six papers released in this series explored online credit recovery approaches and was titled, Using Online Learning for Credit Recovery and At-Risk Students. According to the paper, more than half of the school districts in the United States offer online courses and services, and the number of online offerings are growing rapidly, at 30 percent annually (Watson & Gemin, 2008). Goals related to online credit recovery, as cited

in the paper, are helping students accumulate credits to meet graduation requirements, meet graduation deadlines, prepare students for state exams, get dropouts back on track, provide educational equity, and meet budgetary concerns while trying to serve all students. Watson and Gemin make it clear that success stories and anecdotes regarding the benefits and value of online learning for both at-risk students and the schools serving them abound. Watson and Gemin conclude that a need exists for federal funding of quantitative research related to online learning for at-risk students (Watson & Gemin, 2008).

In the last half-century the dropout issue has been recognized, defined, evaluated, and determined to be a national crisis. The forward-thinkers in the United States, and around the world, are now in search of solutions. While empirical research is needed to determine the most successful remedies to the dropout problem, many potential avenues have emerged, online credit recovery being one.

Defining the Dropout Crisis

The extent of the dropout problem can be seen in the United States Department of Education's Status Dropout Rate. The status dropout rate represents the percentage of 16-through 24-year-olds who are not enrolled in school and have not earned a high school credential. The U.S. Department of Education National Center for Education Statistics recently reported that the 2010 national status dropout rate was 7.4 percent. This percentage is even higher for minority students. In terms of raw numbers, this equates to nearly seven thousand students dropping out every school day (Alliance for Excellent Education, 2007).

Public high school graduation rates measure the number of students that graduate from high school on time with a regular diploma. About 42 percent of Hispanic students, 43 percent of African American, and 46 percent of American Indian students will not graduate on time with

a regular diploma, compared to 17 percent of Asian students and 22 percent of White students (Education Week, 2011). Among all races and ethnicities, males graduate at a lower rate than their female peers. On average, 72 percent of male students earn a diploma compared with 78 percent of female students, a gender gap of 6 percentage points that has remained virtually unchanged for years (Education Week, 2013). Minority males consistently fall below the 50 percent mark for graduating on time (Education Week, 2011).

Graduation rates vary greatly across the United States among different regions. Discrepancies are also evident when comparing urban, suburban, and rural settings. The leading states—New Jersey, North Dakota, Vermont, and Wisconsin—each graduate more than 80 percent of their high school students. Fewer than 6 in 10 students graduate in the District of Columbia, Georgia, Louisiana, Nevada, New Mexico, and South Carolina. Nearly 2000 high schools across the country, mainly in urban areas, have been termed by John Hopkins University as *dropout factories*. These schools have a freshman class that shrinks by 40 percent or more by the time students reach their senior year (Alliance for Excellent Education, 2007).

Dropout Consequences

Just a quarter century ago it was possible to drop out of high school, find a job at a living wage, and support a family (Colvin, 2010). Individuals without a diploma could join the military, find a spot on an assembly line, or perform any number of repetitive tasks that are now performed by computers. In recent years, the expansion of the global economy has increased worldwide competition and advances in technology have called for a more skilled workforce. As the demand for jobs increases around the world and the supply of low-level jobs decreases, a high school diploma has become a basic prerequisite for entry into the workforce (Colvin, 2010).

The United States workforce in the present economy is characterized by layoffs, pay cuts, and a reduction of work hours (Wise, 2000). Companies and industries, the economic engines of prior decades, have ushered in policies of frugality and federal policymakers float words such as austerity and bailout. This economic environment is not hospitable for the average citizen without a high school diploma (Wise, 2009). Since the beginning of the economic downturn in December of 2007 the nation's unemployment rate nearly doubled. According to the Bureau of Labor Statistics, in 2009 the unemployment rate in the United States for individuals 25 years and older climbed to 15.4 percent for those without a high school degree. In comparison, the rate for individuals with a high school degree at that time was 9.4 percent and 4.7 percent for those with a bachelor's degree (Bureau of Labor Statistics, 2009). Being without a high school diploma is two strikes—you are more likely to make less, and if you have a job, you are more likely to be laid off from it (Wise, 2009).

For the majority of Americans the issue of school dropouts may feel like a distant concern. Most have graduated from school, and for those the perception may be that they have avoided the negative effects of dropping out. According to the Gates report, dropouts earn on average \$9,200 less per year than high school graduates and more than \$1 million less over a lifetime than college graduates (Watson, 2008). For economic reasons alone, dropouts are a drain on state and national resources. Lower local, state, and national tax revenues are perhaps the most obvious consequence of higher dropout rates; even when dropouts are employed, they earn significantly lower wages than graduates (Alliance for Excellent Education, 2007).

High school graduates earn higher wages, which results in attendant benefits to local, state, and national economic conditions, high school graduates live longer (Muennig, 2005), are less likely to be teen parents (Haveman, Wolfe, & Wilson, 2001), and are more likely to raise

healthier, better-educated children. In fact, children of parents who graduate from high school are themselves far more likely to graduate from high school than are children of parents without a high school degree (Wolfe & Haveman, 2002). High school graduates are also less likely to commit crimes (Raphael, 2004), rely on government health care (Muennig, 2005), or use other public services such as food stamps or housing assistance (Garfinkel, Kelly & Waldfogel, 2005). Additionally, high school graduates engage in civic activity, including voting and volunteering in their communities, at higher rates (Junn, 2005). As referenced in research, an individual's decision to leave school without a diploma directly affects his or her standard of living and this decision indirectly affects society as a whole.

Dropout Causes and Predictors

In addressing the dropout crisis, it is critical to recognize that its causes can be related to individual students, their families, the communities in which they live, and also their institutions (Rumberger, 2004). Rumberger (2004) notes that identifying the causes of dropping out is extremely difficult to do because, like other forms of educational achievement (e.g. test scores); it is influenced by an array of proximal and distal factors. The California Dropout Research Project analyzed 25 years of national, state, and local data and 203 published research studies to identify statistically significant predictors of dropping out of high school. Studies were chosen that focused on multivariate, statistical analysis that sought to identify predictors of high school dropout and graduation. Descriptive statistical and qualitative studies were omitted in the meta-analysis to make the sample more manageable. This survey of literature was also limited to studies that were published in scholarly journals (Rumberger & Lim, 2008). To organize his review, the researcher developed a conceptual framework that identified all the key factors that research has identified. He identified two types of general factors that predict if a student drops

out or graduates from high school. Individual factors of the student and institutional factors of the families, school, and community were cited as the two general factors that identify the likelihood of a student becoming a dropout (Rumberger, 2008).

There were four sub-categories cited by Rumberger in relation to individual factors: (1) Educational performance, (2) behaviors, (3) attitudes, and (4) background (Rumberger, 2008). Negative educational performance factors found in the research include poor grades and/or test scores, poor prior academic achievement in elementary or middle school, student mobility, and grade retention. Legters (2006) found that dropouts leave school behind in credits after failing academic courses. Behaviors, both in and out of school, that predict dropping out include skipping class, not completing assignments, and disengagement. Studies on student attitudes focus on specifically educational expectations and an inverse relationship has been found between educational expectations and dropouts. Eighth graders with poor attendance (less than 80 percent) or a failing grade in math, or a failing grade in English had less than a 25 percent chance of graduating within eight years of entering high school (Balfanz 2006). If a student's educational expectations are high then their risk for dropping out tends to be low. A student's background, specifically his or her demographic characteristics and prior experiences, significantly link to the likelihood of dropping out of school. For example, males are more likely to dropout than females (Rumberger 2008).

Institutional factors fall within one of three areas: family, school, and community. Three aspects of families predict whether a student is at risk of dropping out. A student's family structure is a strong predictor in that students living with both parents are less likely to drop out than students living with only one parent. Students who come from single parent families, have a mother who dropped out of high school, have parents who provide less oversight and support

for learning, and who have older siblings who did not complete school are more likely to drop out (Dynarski, 2002). Family resources, such as parental education, parental occupation, and family income are strong family predictors of a student's likelihood of dropping out. The third family factor is family practices. Parents that communicate with their child's school, monitor their child's academic progress, and know their child's friends are less likely to have a dropout (Rumberger, 2008).

Four characteristics of schools have been found to predict the likelihood of a student dropping out. First, the composition of the student body affects a student's decision to drop out. Schools with more advantaged students tend to have fewer dropouts. Second, a school's resources have been shown to predict student dropout rates. Schools with dropout prevention programs have shown improved graduation rates. Third, a school's structural features have been found to predict the probability of a student dropping out. Strong evidence suggests that smaller class size in grades K – 3 improve high school graduation rates. Fourth, a high school's policies and practices do matter when considering dropouts. Schools with a stronger academic climate have shown to produce more high school graduates proportionately (Rumberger, 2008). Dropouts also are more likely to have shown signs of disengagement from school: High rates of absenteeism or truancy, poor classroom behavior, less participation in extracurricular activities, and bad relationships with teachers and peers all have been linked to lower chances for graduation (Lehr, Johnson, Bremer, Cosio, & Thompson, 2004).

A student's community plays a role in predicating their likelihood of dropping out of school. Students living in more affluent neighborhoods tend to graduate at a higher rate than students living in a high-poverty neighborhood (Rumberger, 2008).

Researchers have found that dropping out of school stems from a wide variety of factors in four areas or domains: individual, family, school, and community factors (Hawkins, Catalano, & Miller, 1992; Rumberger, 2001). A combination of these predictors or factors increases the likelihood that students will dropout. It is also important to note that dropping out of school is not a single event; rather, dropping out of school is the final event in a dynamic and cumulative process of disengagement (Newmann, Wehlage & Lamborn, 1992).

Characteristics of Effective Dropout Prevention Programs

Programs intended to stem the dropout problem vary greatly in focus and design. Based on a thorough analysis of the available professional literature on effective interventions used to prevent students from dropping out, Lehr, Johnson, Bremer, Cosio, & Thompson, (2004) found that most effective interventions could be categorized as follows:

- (1) Personal/affective (e.g. individual counseling)
- (2) Academic (e.g. provision of special academic courses, tutoring, individualized instruction)
- (3) School Structure (e.g. reducing class size)
- (4) Work related (e.g. vocational training) (Lehr et al., 2004, p. 18).

Lehr et al. (2004) synthesized research-based dropout prevention programs and offered examples of interventions that show evidence of effectiveness. The purpose of this study was to ask, “What do we know about effective dropout prevention and intervention that is research-based, and how can that information be used to inform practice?” (Lehr et al., 2004, pp. 2). The intended outcomes of this study were to increase knowledge of current research on dropout prevention programs and to show the effectiveness of dropout prevention and intervention programs. Dropout prevention programs were chosen for this study by meeting three criteria: (1)

they focused on dropout prevention, (2) they appeared to show effectiveness using a research or evaluation design, and (3) results were published between 1988 and 2003. The majority of effective dropout prevention programs involve the use of personal/affective interventions. Nearly half of the programs reviewed by Lehr et al. had an academic component. Most of the programs studied involved the use of more than one type of intervention. For example, most programs incorporated personal/affective interventions, such as individual counseling, as well as academic provisions, such as special academic courses. Lehr et al. synthesized a series of dropout preventions and interventions and found effective programs in all four categories, personal/affective, academic, school structure, and work related.

Dynarski (2001) conducted three evaluations on the effectiveness of programs to reduce dropping out. Dynarski interpreted evidence from more than one-hundred dropout prevention programs and findings from the three evaluations show that most programs did not reduce dropping out by statistically significant amounts, but some programs did improve student outcomes. The evaluations were broad-ranging and two of the three relied on random assignment to measure program effects reliably. Dynarski concluded that his findings do not provide a menu of programs to prevent dropping out; however, his work puts a premium on the ability of a program developer to readily see or infer the logic behind particular dropout prevention programs. According to Dynarski, dropout prevention programs are more desirable when it is clear how they can be expected to affect teaching or learning, or keep students in school. Dynarski found that successful programs create small schools with smaller class sizes, allow teachers to know students better, build time for individual assistance, and focus on helping students with personal and family issues (Dynarski, 2001).

Schargel and Smirk (2001) co-authored a book titled; Strategies to Help Solve our School Dropout Problem that evaluated strategies that help alleviate the school dropout problem.

Fifteen strategies were identified with the assistance of the National Dropout Prevention Center. Since 1986 the National Dropout Prevention Center has focused on dropout prevention programs that show statistically significant results. These strategies, listed below, although discrete work well together and often times overlap:

- (1) Systemic Renewal - A continuing process of evaluating goals and objectives related to school policies, practices, and organizational structures.
- (2) School-Community Collaboration - When all groups in a community provide collective support to the school, a strong infrastructure sustains a caring supportive environment.
- (3) Safe Learning Environments - A safe learning environment provides daily experiences that enhance positive social attitudes and effective interpersonal skills in all students.
- (4) Family Engagement - Research consistently finds that family engagement has a direct, positive effect on children's achievement.
- (5) Early Childhood Education - Birth-to-five interventions demonstrate that providing a child additional enrichment can enhance brain development.
- (6) Early Literacy Development - Early interventions to help low-achieving students improve their reading and writing skills establish the necessary foundation for effective learning.
- (7) Mentoring/Tutoring - Mentoring is a supportive relationship between a mentor and a mentee that is based on trust. Tutoring, also a one-to-one activity focuses on academics.
- (8) Service-Learning - Service-learning connects meaningful community service experiences with academic learning.

- (9) Alternative Schooling - Alternative schooling provides potential dropouts options that can lead to graduation, with programs paying attention to the student's individual needs.
- (10) After-School Opportunities - Many schools provide after-school and summer enhancement programs that eliminate information loss and inspire interest.
- (11) Professional Development - Teachers who work with youth at risk of academic failure need to feel supported and have an avenue by which they can continue to develop skills.
- (12) Active Learning - Active learning embraces teaching and learning strategies that engage and involve students in the learning process.
- (13) Educational Technology - Technology offers some of the best opportunities for delivering instruction to engage students in authentic learning, addressing multiple intelligences, and adapting to students' learning styles.
- (14) Individualized Instruction - An individualized instructional program for each student allows for flexibility in teaching methods and motivational strategies.
- (15) Career and Technology Education - School-to-work programs recognize that youth need specific skills to prepare them to measure up to the larger demands of today's workplace (Schargel and Smirk , 2001, pp. 40-44).

The National Center for Education Evaluation and Regional Assistance published a dropout prevention guide in 2008 that listed six recommendations when planning and executing dropout prevention strategies. The recommendations are as follows:

- (1) Utilize a diagnostic data system that tracks dropouts and students at risk of dropping out
- (2) Assign adult advocates to at-risk students
- (3) Provide academic support and enrichment to improve academic performance
- (4) Implement programs to improve student behavior

(5) Personalize the learning environment

(6) Provide rigorous and relevant instruction to engage students (NCES, 2008, p. 6)

The need for effective programs that address the nation's dropout problem is evident when considering the dropout statistics. Many programs, over years of trial and error, have reported promising interventions used to reduce the number of high school dropouts. What is found to be lacking is empirical research that concludes, through study, which dropout programs or interventions show statistically significant results.

Credit Recovery

The population of students at risk of dropping out of school includes students in need of recovering credits or courses needed for graduation. Students need to recover credit because they have not completed course work required for graduation. The primary goal of credit recovery programs is to give students an opportunity to retake classes that they failed in an effort to get them back on track and keep them in school (Watson & Gemin, 2008). The most common form of credit recovery is summer school - courses held during school summer vacation, taken for remedial purposes, as part of an academic program (Borman, 2001). Students who have failed a course during the traditional school year attend school during the summer months to acquire instruction and credit in a particular course needed to satisfy graduation requirements. Credit recovery is used to increase high school graduation rates in schools nationwide. As the federal graduation rate became a measure of school accountability so grew the number of credit recovery options. School divisions use summer months, after and before school hours, and creative scheduling to offer students opportunities to recovery lost credits needed for graduation.

Online Credit Recovery

As schools across the nation struggle to keep students on track and re-engage students who are off track, online learning has emerged as a promising and increasingly popular strategy for credit recovery: more than half of respondents from a national survey of administrators from 2,500 school districts reported using online learning in their schools for credit recovery, with just over one-fifth reporting “wide use” of online learning for this purpose (Greaves & Hayes, 2008). The International Association for Online Learning defines credit recovery as passing and receiving credit for a course in which a student was previously unsuccessful in earning academic credit for graduation (Eduviews, 2009). Online credit recovery courses offer students the flexibility to accumulate credit, typically in a more condensed timeframe, and get back on track to graduate on time with his/her peers. Students who have failed a course during the traditional school year can log-in anytime and anywhere to acquire instruction and credit in a particular course needed to satisfy graduation requirements.

As online instruction continues to advance, credit recovery has expanded beyond traditional means and evolved to include online options. According to Setzer and Greene (2005), the primary reason online courses are offered in school districts is to expand offerings to courses that would otherwise be unavailable, the second most commonly cited reason for offering online learning is to meet individual student needs. Recent estimates suggest that 1.5 million elementary and secondary students participated in some form of online learning in 2010 (Wicks, 2010).

The Growth of Online Learning in Public Education

In 2010, the United States Department of Education released [A Blueprint for Reform: the Reauthorization of the Elementary and Secondary Education Act](#). This publication places

emphasis on fostering innovation and excellence by offering incentives to schools that offer high-quality online learning programs. The blueprint also references the United States Department of Education's commitment to providing additional support and giving priority to schools successfully utilizing technology to address student needs (United States Department of Education, 2010).

In Virginia, beginning with the 2013 freshman class, all students pursuing a standard or advanced-studies diploma must take an online course or part of a course to graduate (VDOE, 2013). Virginia is now one of five states and numerous school divisions requiring an online course as a graduation requirement. Michigan was the first state requiring an online course for graduation, in 2008, and since then Florida, Alabama, Idaho, and Virginia have passed legislation mandating this requirement (Sheehy, 2012).

According to the Evergreen Education Group, which works with school divisions to implement online learning programs, students taking an online course grew 16 percent between 2011 and 2012. This percentage, by all estimations, will continue to rise exponentially (Sheehy, 2012).

Online Learning in Virginia

During the 2010 legislative session the Virginia General Assembly passed legislation laying the groundwork for virtual schools in Virginia. The legislation required the Superintendent of Public Instruction to develop and the Virginia Board of Education to approve criteria for approving, monitoring, and, if necessary, revoking the contracts of multidivisional providers of online courses and virtual school programs (VDOE, 2012). The *Code of Virginia* now reads:

§ 22.1-212.25.C - Beginning November 1, 2011, and annually thereafter, the Board of Education shall include in its annual report to the Governor and the General Assembly information regarding multidivisional online learning during the previous school year. The information shall include but not be limited to student demographics, course enrollment data, parental satisfaction, aggregated student course completion and passing rates, and activities and outcomes of course and provider approval reviews (Virginia Department of Education, 2012, pp. 2).

This bill allowed local school boards to enter into contracts with approved online education providers for services that include online courses, virtual schools, and credit recovery programs. This legislation also gave the Virginia Board of Education the authority to draft the application, appeal, and monitoring procedures for online providers. Thirteen online providers were approved to offer virtual education services in the first application year, and an additional six were approved during the second application window, making the total number of multidivisional online providers in Virginia, 19. Eleven of the original 13 approved online providers offered courses to Virginia students during the 2011-2012 school year. The Virginia Department of Education conducted monitoring interviews with the 11 providers that offered courses during the 2011-2012 school year: Apex Learning; BYU Independent Study; CCPS Online - Chesterfield County Public Schools; CompuHigh, LLC; Connections Academy, LLC; EdOptions Online Academy; Education2020, Inc.; FLVS Global School; K12 Virtual Schools, LLC; The VHS Collaborative; and York County School Division (VDOE, 2012).

At the conclusion of the 2011-2012 school year, the state student record collection showed that 483 students were enrolled in a virtual course during the year. During the same monitoring window, online providers submitted course enrollment numbers that exceeded 2200. The discrepancy between the state student record collection and the online provider enrollment submission is believed to be an issue of current record keeping practices pertaining to online courses. For example, many school divisions do not code online and traditional courses differently within student records (VDOE, 2012). This discrepancy, along with many others, currently makes it difficult to report accurately on the status of online learning opportunities in the Commonwealth of Virginia. These challenges have been recognized and addressed by the Virginia Department of Education.

The Annual Status Report Regarding Online Learning published by the Virginia Department of Education (2012) addressed many of the challenges the Commonwealth is experiencing as it transitions to offering online learning opportunities. The Virginia Superintendent of Public Instruction detailed nine challenges from the monitoring reports and stakeholder interviews. The challenges are listed below:

- (1) There are significant discrepancies in the enrollment data submitted by providers and data reported by school divisions through the Student Record Collection.
- (2) During the 2011-2012 school year, several multi-division online providers used teachers who were not licensed to teach in Virginia.
- (3) Providers' course names were not the same as those used in the SOL. For example, one provider's World Literature II course was comparable to the English Grade 10 SOL.

- (4) The *Code of Virginia* requires that school divisions provide information on local division Web sites detailing virtual and online learning opportunities for students. A review found that many division Web sites do not provide the required information.
- (5) Some providers were not responsive to requests for information from school divisions.
- (6) Approved providers must list courses approved by the Department of Education on a Web page. Several provider Web pages included all the courses they offered, including ones not approved by the Department of Education.
- (7) Criteria established by the Board of Education for multi-division online providers states that all teachers hired by a multi-division online provider to provide instruction to students must (1) meet the requirements set forth in sections § 22.1-296.1 and 22.1-296.2 of the *Code of Virginia* and (2) be highly qualified, licensed by the Virginia Board of Education, and endorsed in their course content area. During the monitoring process, the Department noted that several providers have not provided licensure information for all their teachers.
- (8) Some approved providers and school divisions remained uncertain about what constitutes a multi-division online provider as compared to a provider of online content taught by local teachers.
- (9) Some approved providers offered courses during the 2011-2012 school year that were not approved by the Department of Education (VDOE, 2010, pp. 9-10).

Despite the issues mentioned by the Virginia Department of Education, online learning opportunities continue to expand and school divisions continue to seek virtual course offerings. Multi-division online course providers offered a total of 765 approved standards-based and non-

standards-based courses during the 2011-2012 school year. Seventy-five of the 132 Virginia school divisions offered online learning opportunities to their students during the 2011-2012 school year. School divisions stated that the top two reasons for offering online courses were to expand curricular offerings and to provide credit recovery opportunities (VDOE, 2012).

Benefits of Online Credit Recovery Programs

According to a report by Civic Enterprises in association with Peter D. Hart Research Associates for the Bill & Melinda Gates Foundation, forty-seven percent of high school dropouts reported the reason for dropping out was related to disinterest in classes and school (Bridgeland, 2006). Advocates of online credit recovery programs contend that struggling learners have the ability to learn at a pace they are most comfortable with. Online learning boasts the capability of being self-paced, available anytime, with consistent instruction, rigorous assessment, and economic feasibility (Luopa, 2010). Programs providing online credit recovery for at-risk students have been provided in almost every variation of time, location and instructional method imaginable (Watson & Gemin, 2008). Courses taken in an online credit recovery format can be structured to suit the needs of individual learners.

With traditional credit recovery options, such as repeating a year-long course or repeating a course in summer school, students are expected to repetitiously cover material that they may have mastered. When student focus and engagement are a concern repeating previously mastered content can be detrimental. Online credit recovery courses tend to be mastery-based learning where students take a pre-test and any material mastered is omitted from the course outline. This allows students to bypass previously mastered content and focus on areas of difficulty. Mastery based credit recovery courses give students the opportunity to feel successful by letting them test out of content they can prove mastery of (Patrick & Sturgis, 2011).

Many high school dropouts report becoming disenfranchised with their school as a basis for their decision to leave school (Bridgeland, 2006). Many students who drop out have become disenchanted with and disenfranchised from their schools because they do not have the skills that allow them to be engaged in their own education (Noble, 2006). Most online credit recovery options are diagnostic-driven programs that customize and personalize a course around a specific student's strengths and weaknesses.

Disadvantages of Online Credit Recovery

Beginning November 1, 2011, and annually thereafter, the Virginia Board of Education shall include in its annual report to the Governor and the General Assembly information regarding multi-division online learning during the previous school year (VDOE, 2012). This provision in the Virginia Code is relatively new. For this reason, there seems to be a lack of empirical data on the success of students in these programs. Critics point out that this lack of research makes it difficult to answer a fundamental question: Are students truly learning the material or are they being passed through the system in order to meet graduation benchmarks?

Many online credit recovery programs lack a teacher or at least a teacher in close proximity to the student. Opponents contest that students that formerly failed a course due to a lack of understanding will have a difficult time succeeding without the support of a content-area teacher.

Many critics fear that the improved access of innovative credit recovery options will discourage students from working to their full potential when taking the class for the first time in a traditional setting (Center for Public Education, 2012). The perception is that students can spend far less time *plugged-in* to the program and receive the same credit that traditional courses take 180 days to cover.

Shyles (2002) describes two very important types of academic dishonesty that are important to consider in online classes: impersonation and misrepresentation. In virtual learning impersonation takes place when a student assumes the identity of another student to complete assignments on their behalf. Misrepresentation occurs in online learning environments when a student submits work that is not their own. Online content providers use technologies that assess the authenticity of their users. Another practice used to prevent these violations from occurring is to have students complete course work online and to complete assessments at a secure testing location.

Issues of equity have arisen in relation to seat-time and credit recovery courses (Otterman, 2011). Potentially students that complete a course via online instruction can spend substantially less time to complete the course than a student taking the course in the traditional format. The recording of grades and high school transcripts has also been a point of contention (Beamon, Brown & Garland 2010). Should students who took an online credit recovery course be given a grade equivalent to that of a student who took a course in the traditional setting? School districts mandate how grades are recorded on students' transcripts: as a complete replacement, additional grade, average, or other alternative, raising questions of fairness for different student bodies (Center for Public Education, 2012). The North Carolina State Board of Education took steps toward uniformity and fairness in the fall of 2011, when all credit recovery classes, regardless of the program type, received a final PASS/FAIL grade (Beamon et al. 2010).

Summary

This chapter has provided a literature review focused on the issue of high school dropouts in the United States. Recent statistics on dropouts were reviewed, the consequences associated with dropping out were considered, and research on dropout causes and predictors were

evaluated. The chapter continued with potential solutions to the issue and characteristics of effective dropout prevention programs. Research on the many facets of online learning in public education were reviewed, specifically in the Commonwealth of Virginia. This chapter reviewed online credit recovery as a means of preventing students from dropping out of high school. Finally, the chapter concluded with an explanation of the benefits and disadvantages of online credit recovery. The chapter began with the issue of high school dropouts in the United States and continued with a potential solution for high school dropouts in online credit recovery.

Chapter Three: Methodology

As the number of high school dropouts continue to be a challenge, as pressure from lawmakers intensifies on schools to increase graduation rates, and as society is burdened with the ill effects of more and more dropouts it is critical that all potential solutions be thoroughly researched. Many educational leaders and policymakers are searching for innovative programs designed to prevent students from leaving school without a diploma as well as address accountability measures that have resulted from No Child Left Behind. The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses.

Researchers have explored the status of online courses and the growth of virtual education in the public school system (Means, Toyama, Murphy, Bakia & Jones 2009; Watson & Gemin, 2009) but little emphasis has been placed on the effectiveness of online credit recovery with students at risk of dropping out of high school. The need for empirical research is increasing as the demand for online credit recovery grows.

Research Design

An ex post facto quantitative method was used to answer the research questions associated with this study. Archival data from an online content provider was utilized in this study indicating that the research design is non-experimental. Non-experimental research lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both. This research is useful in situations where it is not possible or not ethical to manipulate the variable of interest (Price, 2012). The independent variables in this study include selected demographic characteristics with values that are inherent to those students considered at risk of dropping out of high school. The independent variables were gender, socio-economic status, ethnicity, and course taken. The dependent variable used to measure a student's success in an online credit recovery course was the final grade in the online credit recovery course. The study was organized to measure the difference in student's final grade for online credit recovery core courses and for online credit recovery elective courses.

This study was exploratory in nature using both descriptive and inferential statistics to determine if students were successful in an online credit recovery environment. The study was comparative in that it evaluated several variables in an attempt to determine what differences exist in a student's online credit recovery course final grade based on their gender, socio-economic status, race/ethnicity and course taken. It is important to make clear that a relationship

between, gender, socio-economic status, race/ethnicity, and course taken and a student's final course grade is not an attempt to show causality. The emphasis of this part of the study was to see if there is a difference in a student's final grade in an online credit recovery course based on characteristics associated with students at risk of dropping out of high school.

A quantitative research design was necessary, as the goal of this study was to determine if a difference exists between student's final grade in an online credit recovery core or elective course, based on certain demographic factors inherent to students at risk of dropping out. In general, a quantitative research design evaluates the relationship between the independent variable and the dependent variable (Babbie, 2010). This study used descriptive statistics to evaluate the success of students in an online credit recovery core course and an online credit recovery elective course. This design provided a systematic analysis about the success of online credit recovery as a method of instruction to help students regain lost credits.

Research Questions

This study explored the following research questions:

1. What percent of students who enroll in an online credit recovery core course regain lost credits?
2. What difference is there in the student's final grade in an online credit recovery core course based on student gender?
3. What difference is there in the student's final grade in an online credit recovery core course based on student socio-economic status?
4. What difference is there in the student's final grade in an online credit recovery core course based on student race/ethnicity?

5. What difference is there in the student's final grade in an online credit recovery core course based on course taken?
6. What percent of students who enroll in an online credit recovery elective course regain lost credits?
7. What difference is there in the student's final grade in an online credit recovery elective course based on student gender?
8. What difference is there in the student's final grade in an online credit recovery elective course based on student socio-economic status?
9. What difference is there in the student's final grade in an online credit recovery elective course based on student race/ethnicity?
10. What difference is there in the student's final grade in an online credit recovery elective course based on course taken?

Nul and Alternative Hypotheses

The following nul and alternative hypotheses contributed to the growing body of research on the effectiveness of online credit recovery for students at risk of dropping out of high school:

Hypothesis 1.

H₀1: Online credit recovery has no effect on students in the recovery of lost credits in core courses.

H_a1: Online credit recovery has an effect on students in the recovery of lost credits in core courses.

Hypothesis 2.

H₀2: There is no difference between the student's final grade in an online credit recovery core course based on the student gender.

H_a2: There is a difference between the student's final grade in an online credit recovery core course based on the student gender.

Hypothesis 3.

H₀3: There is no difference between the student's final grade in an online credit recovery core course based on the student socio-economic status.

H_a3: There is a difference between the student's final grade in an online credit recovery core course based on the student socio-economic status.

Hypothesis 4.

H₀4: There is no difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity.

H_a4: There is a difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity.

Hypothesis 5.

H₀5: There is no difference between the student's final grade in an online credit recovery core course based on the course taken.

H_a5: There is a difference between the student's final grade in an online credit recovery core course based on the course taken.

Hypothesis 6.

H₀6: Online credit recovery has no effect on students in the recovery of lost credits in elective courses?

H_a6: Online credit recovery has an effect on students in the recovery of lost credits in elective courses?

Hypothesis 7.

H₀7: There is no difference between the student's final grade in an online credit recovery elective course based on the student gender.

H_a7: There is a difference between the student's final grade in an online credit recovery elective course based on the student gender.

Hypothesis 8.

H₀8: There is no difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status.

H_a8: There is a difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status.

Hypothesis 9.

H₀9: There is no difference between the student's final grade in an online credit recovery elective course based on the student race/ethnicity.

H_a9: There is a difference between the student's final grade in an online credit recovery elective course based on the student race/ethnicity.

Hypothesis 10.

H₀10: There is no difference between the student's final grade in an online credit recovery elective course based on the course taken.

H_a10: There is a difference between the student's final grade in an online credit recovery elective course based on the course taken.

Site Selection

The online content provider chosen to provide the data for this study is a nationally recognized online content provider serving students from kindergarten to twelfth grade. As an online tuition-free public school option for K – 12 students, the online content provider has a reputation for serving school age children throughout the United States and has a reputation for being good stewards of their performance data. The online content provider offers state-certified teachers, an Individualized Learning Plan for each student, a combination of online and offline coursework—including a wide array of textbooks, CDs, videos, and hands-on materials, and a loaner computer and subsidized Internet access program. The data requested for this study included gender, race/ethnicity, socio-economic status, course taken, and final grade for students enrolled in a course offered by the online content provider in the United States during the 2012-2013 school year. The researcher and online content provider agreed on terms related to the research as seen in the Research Agreement in Appendix B. The online content provider requested to remain anonymous for the purposes of this study.

Population

There were no participants directly involved in the study; however, the data were generated from the performance and demographic data of students in the United States enrolled in the online content provider's program for credit recovery during the 2012-2013 school year. The online content provider's credit recovery program offers courses in English, mathematics, natural/physical science, social science, and many electives. The core courses used in this study were Literary Analysis and Composition 9, Literary Analysis and Composition 10, American Literature 11, British and World Literature 12, Pre-Algebra, Algebra 1, Geometry, Algebra 2, Calculus, Earth Science, Biology, Physical Science, Chemistry, Geography and World Cultures,

World History, Modern World Studies, U.S. History, and U.S. Government and Politics. Core courses were sorted by the following academic disciplines: English, Mathematics, Science, and History and Social Sciences. The elective courses used for this study were Accounting, Career Planning, Civics, Consumer Math, Contemporary World Issues, Creative Writing, Drivers Safety, Economics, Family and Consumer Science German, Health, Integrated Math, Japanese, Life Skills, Music Appreciation, Nutrition and Wellness, Personal Finance, Physical Education, Programming, Psychology, Sociology, Spanish, and Web Design. Elective courses were sorted in the following academic disciplines: Career Technical Education, English, Fine Arts, History and Social Sciences, Life and Career Planning, Mathematics, Physical Education, and World Languages. All student data used for this study were generated by an online content provider that specializes in credit recovery. The total number of students taking a credit recovery course in the study was 41,435 with 16,698 students taking a core course and 24,737 students taking an elective course. There is an understanding and agreement by the researcher and the online content provider that the study did not require access to individuals or access to data that identify individuals. A statistician employed by the online content provider generated a separate research database for this study by pulling data out of existing local databases owned and serviced by the online content provider. The statistician removed any information from the database that remotely identified any individual.

Procedures

The following procedures explain how the data for this study were collected and managed. This ex-post facto study was designed to use archival data provided by an online content provider that chose to remain anonymous. The online content provider maintains an internal database of user information that is only accessed internally and upon written request by

those outside of the organization. The online content provider required the researcher to sign a research agreement outlining the impartial relationship that was maintained to ensure a quality research study. The Research Agreement may be seen in Appendix D. This archival data, once received from the online content provider, were reviewed and analyzed after gaining approval by the Virginia Polytechnic Institute and State University Institutional Review Board (IRB). The online content provider assigned a coded number to each student in its database and all distinguishable personal information was removed. No information that identified individual students was given to the researcher and there was no means or effort to communicate with individuals through the study. Information on student's gender, socio-economic status, race/ethnicity, course taken, and final grade was given to the researcher in the form of an Excel spreadsheet. Data received by the researcher contained a row entry for each credit recovery course attempted by a student through the online content provider. Each row of data included the student's coded number, gender, socio-economic status, race/ethnicity, course taken and final grade. Following receipt of the data, the researcher reviewed the dataset and used listwise deletion to remove any row of data that was incomplete (i.e. missing final grade).

In order to analyze the data in SPSS, each variable was renamed with a SPSS label and each value was given a numeric code. Independent variables included the student's gender, (GENDER), the student's socioeconomic status, (SOCIOECONOMIC_STATUS), the student's race/ethnicity, (RACE_ETHNICITY), and the course the student took, (COURSE_TAKEN). The courses were organized by academic discipline and the discipline (DISCIPLINE) variable was created. The dependent variables were labeled as student's pass/fail grade, (PASS_FAIL), and the student's letter grade, (LETTER_GRADE). The numeric codes given for gender were 0 for male and 1 for female. The numeric code for socioeconomic status were 0 for unknown

eligibility, 1 for free lunch eligible, 2 for reduced lunch eligible, 3 for not eligible. The numeric codes given for race/ ethnicity were 0 for Undefined, 1 for American Indian or Alaska Native, 2 for Asian, 3 for Black or African American, 4 for Hispanic or Latino, 5 for Multi-Racial, 6 for Native Hawaiian or Other Pacific Islander, and 7 for White. The numeric code for the course the student took is seen in the table 1 below.

Table 1

Numeric Code for Course Taken Variable

Course Taken	Numeric Code
Accounting	1
Algebra 1	2
Algebra 2	3
American Literature 11	4
Biology	5
British and World Literature 12	6
Calculus	7
Career Planning	8
Chemistry	9
Civics	10
Consumer Math	11
Contemporary World Issues	12
Creative Writing	13
Drivers Safety	14
Earth Science	15
Economics	16
Family and Consumer Science	17
Geography and World Cultures	19
Geometry	20
German	21
Health	23
Integrated Math	24
Japanese	25
Life Skills	26
Literary Analysis and Composition 10	27
Literary Analysis and Composition 9	28
Modern World Studies	29
Music Appreciation	30

Nutrition and Wellness	31
Personal Finance	32
Physical Education	33
Physical Science	34
Pre-Algebra	35
Programming	36
Psychology	37
Sociology	38
Spanish	39
U.S. Government and Politics	22
U.S. History	43
Web Design	44
World History	45

The numeric code for core course discipline was 1 for English, 2 for History and Social Science, 3 for Mathematics and 4 for Science. The numeric code for elective course discipline was 1 for Career Technical Education, 2 for English, 3 for Fine Arts, 4 for History and Social Sciences, 5 for Life and Career Planning, 6 for Mathematics, 7 for Physical Education, and 8 for World Languages. The numeric code for the student's pass/fail grade is 0 for fail and 1 for pass. The numeric code for a student's letter grade is 0 for an F, 1 for a D, 2 for a C, 3 for a B, and 4 for an A.

The student data were housed on two flash drives, both under lock and key once received by the researcher. The data were only accessible to the researcher and only for the purposes of the study. The data will be destroyed three years after the successful defense of the associated dissertation.

This study took place in the fall of 2014 using data that were compiled during the 2012-2013 school year. Following the analysis of the data using a statistical software package the Data Analysis and Results, Implications, and Recommendations sections of the dissertation were written and prepared for final defense.

Data Analysis

Analysis of data were completed through the use of the Statistical Program for the Social Sciences (SPSS) software. The significance level was established at $p < .05$ as is customary for this type of study. A variety of data analysis methods, mentioned below, were utilized in the scope of this study to include descriptive statistics, independent t -tests, and analyses of variance (ANOVA). Initially, the researcher ran frequency distributions for each independent variable (gender, race/ethnicity, socio-economic status, and course taken) and the dependent variable (final grade) for core courses and for elective courses. This allowed the researcher to analyze the frequency of occurrences and summary statistics, as well as determine if the data were parametric or non-parametric. The use of parametric statistics and the ability to generalize to the sample population can be achieved when the data are normally distributed, have homogeneity of variance, and are continuous (Manly, 2005).

Descriptive statistics were used to answer research question 1 and research question 6. Research question 1 and 6 were, What percentage of students who enroll in an online credit recovery core course regain lost credits? and What percentage of students who enroll in an online credit recovery elective course regain lost credits?, respectively. The 16,698 students in the study who took an online credit recovery core course were divided by the number of students who passed their online credit recovery core course. Also, the 24,737 students in the study who took a credit recovery elective course were divided by the number of students who passed their online credit recovery elective course. This allowed the researcher to determine a percentage of students who passed and a percentage of students who failed for both the online credit recovery core and elective courses. This allowed the researcher to determine what percentage of students

were successful at recovering credits and what percentage of students were unsuccessful at recovering credits through online credit recovery core and elective courses in the study.

Research question 2 and research question 7 were designed to evaluate what differences existed in student's final grade based on whether the student was male or female. Research question 2 and 7 were, What difference is there in the student's final grade in an online credit recovery core course based on student gender? and What difference is there in the student's final grade in an online credit recovery elective course based on student gender?, respectively. For these questions, because there are only two independent groups (i.e. male and female), an independent sample *t*-test was used with gender as the independent variable and the student's final grade as the dependent variable. The *t*-test evaluates whether the mean value of the test variable for one group (e.g. males) differs significantly from the mean value of the test variable for the second group (e.g. females) (Cochran, 1957). This inferential statistical test determined whether there is a statistically significant difference between the final grade means of the male and female students that took an online credit recovery core course and an online credit recovery elective course. Because the researcher was unsure as to whether or not gender made a positive or negative impact, the *t*-test was non-directional.

Research question 3 and research question 8 were designed to evaluate differences in a student's final grade based on whether the student is on free lunch, reduced lunch, not eligible for free/reduced lunch, or unknown free/reduced lunch status for online credit recovery core courses and for online credit recovery elective courses. Research question 3 and research question 8 were, What difference is there in the student's final grade in an online credit recovery core course based on student socio-economic status? and What difference is there in the student's final grade in an online credit recovery elective course based on student socio-economic status?,

respectively. Income eligibility guidelines from the National School Lunch Program were used as a measure of socio-economic status for this study. Because these questions involved comparing the means of more than two groups the researcher used an Analysis of Variance (ANOVA) test. ANOVA is a statistical method of analyzing highly structured data by decomposing variance into different sources, and comparing the explained variance at each level to what would be expected by chance alone. The ANOVA statistical technique extends what an independent-samples *t*-test can do to multiple means (Cochran, 1957). According to Creswell (2009), quasi-experiments containing a group comparison with one independent variable, one dependent variable and use interval data, should use an ANOVA as the statistical test.

Research question 4 and 9 are designed to evaluate the differences in student's final grade based on the student's race/ethnicity. Research question 4 and research question 9 were, What difference is there in the student's final grade in an online credit recovery core course based on student race/ethnicity? and What difference is there in a student's final grade in an online credit recovery elective course based on student race/ethnicity?, respectively. For the purposes of this study the United States Office of Management and Budget delineations for race/ethnicity were used. The race/ethnicities recorded in the study are American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Multi-Racial, Native Hawaiian or Other Pacific Islander, Undefined or White. The analysis for research questions 4 and 9 was completed through the use of ANOVA tests that compared the student's final grade mean for each race/ethnicity group. This allowed the researcher to determine if a difference exists between means for each race/ethnicity for students taking an online credit recovery core course and for students taking an online credit recovery elective course.

Research question 5 and research question 10 were designed to evaluate differences that exist in student's final grade based on the course the student took. Research question 5 and research question 10 were, What difference is there in the student's final grade in an online credit recovery core course based on course taken? and What difference is there in the student's final grade in an online credit recovery elective course based on course taken?, respectively. This study organized core courses in the following academic disciplines: English, History and Social Science, Mathematics, and Science and evaluated the mean differences. The following core courses: Literary Analysis and Composition 9, Literary Analysis and Composition 10, American Literature 11, British and World Literature 12, Pre-Algebra, Algebra 1, Geometry, Algebra 2, Calculus, Earth Science, Biology, Physical Science, Chemistry, Geography and World Cultures, World History, Modern World Studies, U.S. History, and U.S. Government and Politics were used in this analysis. This study also organized elective courses in the following academic disciplines: Career Technical Education, English, Fine Arts, History and Social Sciences, Life and Career Planning, Mathematics, Physical Education, and World Languages and evaluated the mean differences. The following elective courses: Accounting, Career Planning, Civics, Consumer Math, Contemporary World Issues, Creative Writing, Drivers Safety, Economics, Family and Consumer Science, German, Health, Integrated Math, Japanese, Life Skills, Music Appreciation, Nutrition and Wellness, Personal Finance, Physical Education, Programming, Psychology, Sociology, Spanish, and Web Design were used in this analysis. The differences that existed between mean values for the academic discipline for research question 5 and research question 10 were analyzed with an ANOVA test. This test allowed the researcher to determine if variance existed in a student final grade means for each core academic discipline and for each elective academic discipline.

For research questions three, four, five, eight, nine, and ten an ANOVA was used to determine if variance exists between the means. Once differences were determined between the group means from the ANOVA tests than a Tukey's post-hoc test was performed for each research question. Tukey's post-hoc test is designed for situations in which the researcher has already obtained a significant omnibus F-test with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other (Stevens, 1999). This test provided a more exhaustive method of exploration as to which means are significantly different from each other for each research question using an ANOVA statistical test.

This analysis helped demonstrate not only whether students at risk for dropping out of high school are able to successfully recover credits through the use of online credit recovery but the analysis also offers insight into which students based on gender, socio-economic status, race/ethnicity, and course taken are more successful at completing an online credit recovery core course and an online credit recovery elective courses.

Chapter Three Summary

This chapter provided information regarding the methods and procedures that were used to collect and analyze data in this quantitative study. This chapter included a restatement of the purpose for this study. Details on the research design were explained. The research questions along with the associated hypotheses were systematically presented. Information on the site selection and the sample population were given. Procedures for the collection and the management of data associated with the study were described. The multiple statistical methods or tests in which the data were analyzed for each research question in the study were explained and the chapter concluded with a chapter three summary.

Chapter Four: Results of the Study

Based on the United States Census Current Population Survey, the status dropout rate decreased from 12 percent in 1990 to 7 percent in 2012, with most of the decline occurring after 2000 (when it was 11 percent). Between 1990 and 2012, the male status dropout rate declined from 12 percent to 7 percent, with most of the decline taking place after 2000 (when it was 12 percent). For female students, the rate declined from 12 percent in 1990 to 10 percent in 2000 and then continued to decline to 6 percent in 2012. In each year from 1990 to 2012, the rate for White students declined from 9 percent to 4 percent; the rate for Black or African American students declined from 13 percent to 8 percent; and the rate for Hispanic or Latino students declined from 32 percent to 13 percent (National Center for Education Statistics, 2014). The National Center for Education Statistics does not keep enrollment figures for online credit recovery; however, their most recent report on the topic found that 55 percent of school districts reported using distance learning, most of it online, during the 2009–10 school year; more than 60 percent of those classes were taken for credit recovery (National Center for Education Statistics, 2011). Over the past five years, APEX Learning, one of the largest online credit recovery providers, reported a revenue increase at a compound annual growth rate of 30 percent (Education Week, 2014). Extrapolated revenue growth for the virtual education sector increased from \$73 million to \$178 million between the 2010-11 and 2011-12 school years, according to a survey conducted by the Washington-based Software and Information Industry Association, or SIIA (Education Week, 2014). The national status dropout rate has decreased since the year 2000 and the growth in online learning, specifically for the purposes of credit recovery, has significantly increased since then.

The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on a student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses.

Demographic Profile of Sample

The online content provider participating in this study served students throughout the United States during the 2012-2013 school year. The online content provider had an enrollment of 41,435 students who took an online credit recovery course during the 2012-2013 school year. The data for this study were disaggregated to answer the research questions in relation to students taking a core course and students taking an elective course.

The total number of students enrolled in the online content provider's credit recovery program and taking a core course during the 2012-2013 school year was 16,698. The number of female students taking an online credit recovery core course was 8,966 (53.7%) and the number of male students was 7,732 (46.3%). Student's socioeconomic status was identified according to their national school lunch status which recognizes students in three categories: free lunch eligible, reduced lunch eligible, and not eligible. This study also recorded students with an unknown eligibility. During the 2012-2013 school year, 7,158 (42.9%) students were identified as free lunch eligible, 2,282 (13.7%) were identified as reduced lunch eligible, 4,249 (25.4%) were not eligible for free/reduced lunch, and 3,009 (18.0%) students had an unknown eligibility. The online content provider's ethnic distribution for students taking a core course was 1.9% American Indian or Alaska Native, 1.6% Asian, 15.6% Black or African American, 6.7%

Hispanic or Latino, 1.3% Multi-Racial, 0.5% Native Hawaiian or Other Pacific Islander, 68.8% White, and 3.7% undefined. Student data were also disaggregated to identify the number and percentage of students taking each core course. The demographic profile for students taking an online credit recovery core course can be seen in Table 2 below.

Table 2

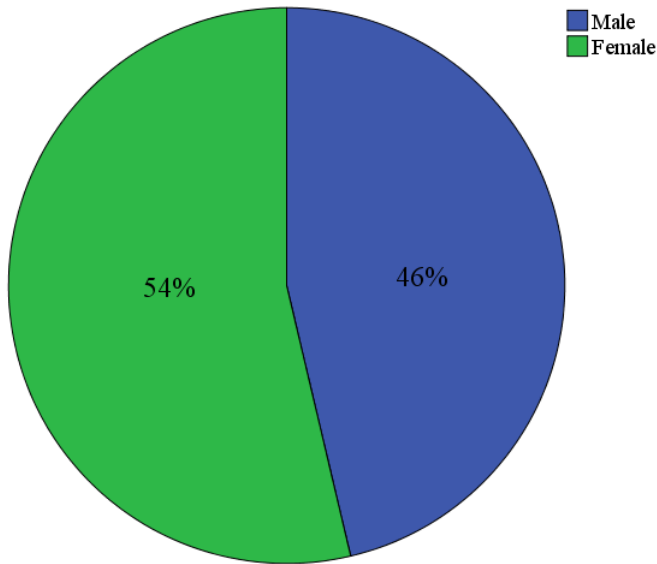
Demographic Profile for Students Taking a Core Course

Demographic	Descriptive Statistics	
	n	%
Sex		
Male	7,732	46.3
Female	8,966	53.7
Socioeconomic Status		
Free Lunch Eligible	7,158	42.9
Reduced Lunch Eligible	2,282	13.7
Not Eligible	4,249	25.4
Unknown Eligibility	3,009	18.0
Race/Ethnicity		
American Indian or Alaska Native	324	1.9
Asian	265	1.6
Black or African American	2,603	15.6
Hispanic or Latino	1,112	6.7
Multi-Racial	212	1.3
Native Hawaiian or Other Pacific Islander	87	0.5
White	11,483	68.8
Undefined	612	3.7
Course Taken		
Literary Analysis and Composition 9	1,965	11.8
Literary Analysis and Composition 10	1,138	6.8
American Literature 11	1,041	6.2
British and World Literature 12	474	2.8
Pre-Algebra	1,017	6.1
Algebra 1	1,552	9.3
Geometry	1,592	9.5
Algebra 2	664	4.0
Calculus	20	0.1
Earth Science	482	2.9
Biology	980	5.9
Physical Science	930	5.6
Chemistry	39	0.2
Geography and World Cultures	1,415	8.5

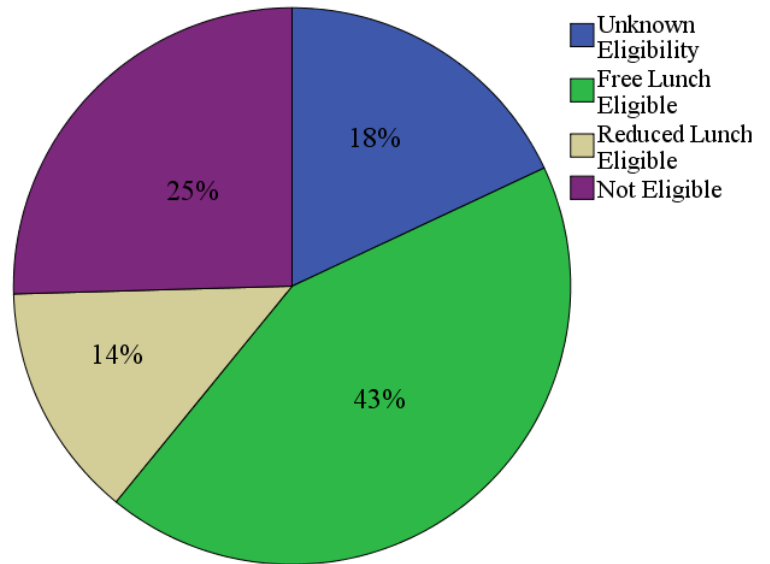
World History	606	3.6
Modern World Studies	444	2.7
U.S. History	2,139	12.8
U.S. Government and Politics	200	1.2

The demographic profile of students taking an online credit recovery core course is displayed below in the form of pie graphs to show the percentage of students with different demographic characteristics.

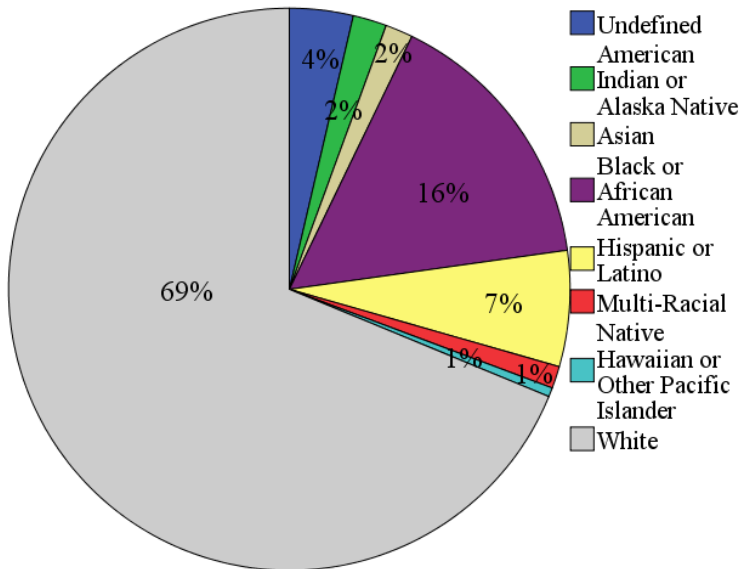
Student Gender Variable



Student Socioeconomic Status Variable



Student Race/Ethnicity Variable



Student Course Taken Variable

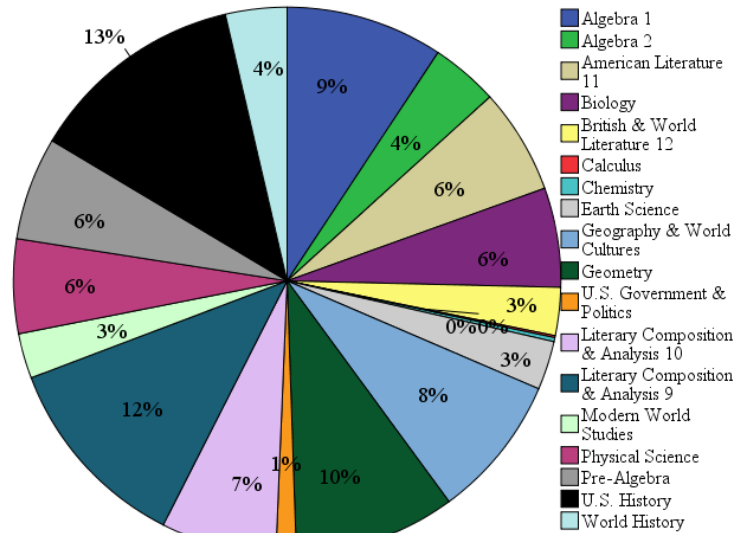


Figure 2. Demographic Profile for Students Taking a Core Course

Below the data are disaggregated to show the demographic profile for students taking an online credit recovery course that is considered an elective. An elective course is a course of study chosen by the student and not considered compulsory. Elective courses for this study were

Accounting, Career Planning, Civics, Consumer Math, Contemporary World Issues, Creative Writing, Drivers Safety, Economics, Family and Consumer Science, German, Health, Integrated Math, Japanese, Life Skills, Music Appreciation, Nutrition and Wellness, Personal Finance, Physical Education, Programming, Psychology, Sociology, Spanish, and Web Design.

The total number of students enrolled in the online content provider's credit recovery program and taking an elective course during the 2012-2013 school year was 24,737. The number of female students taking an online credit recovery elective course was 15,018 (60.7%) and the number of male students was 9,719 (39.3%). During the 2012-2013 school year, 8,756 (35.4%) students were identified as free lunch eligible, 3,159 (12.8%) were identified as reduced lunch eligible, 7,711 (31.2%) were not eligible for free/reduced lunch, and 5,111 (20.7%) students had an unknown eligibility. The online content provider's ethnic distribution for students taking an elective course was 1.7% American Indian or Alaska Native, 2.2% Asian, 12.3% Black or African American, 7.5% Hispanic or Latino, 1.7% Multi-Racial, 0.8% Native Hawaiian or Other Pacific Islander, 70.8% White, and 3.1% undefined. Student data were also disaggregated to identify the number and percentage of students taking each elective course. The number and percentage of students taking each elective course is recorded in Table 3. The complete demographic profile for students taking an online credit recovery elective course can be seen in Table 3 below.

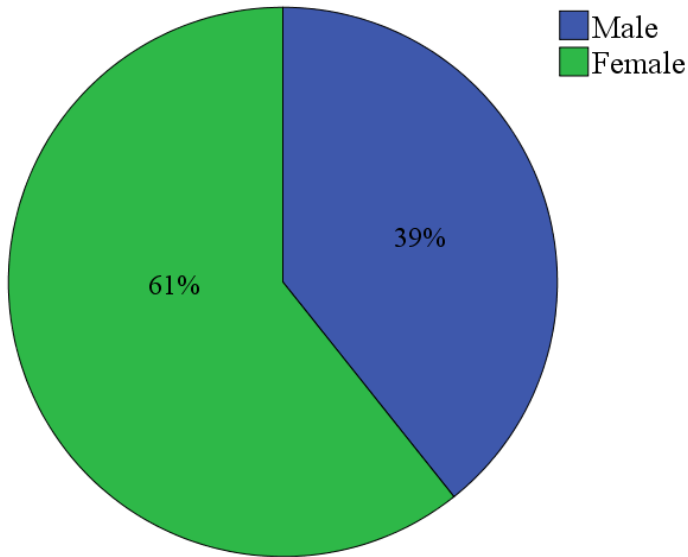
Table 3

Demographic Profile for Students Taking an Elective Course

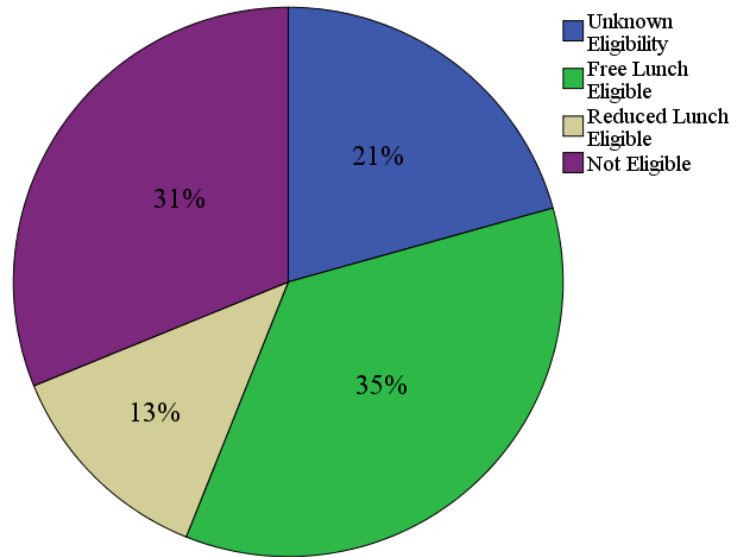
Demographic	Descriptive Statistics	
	n	%
Sex		
Male	9,719	39.3
Female	15,018	60.7
Socioeconomic Status		
Free Lunch Eligible	8,756	35.4
Reduced Lunch Eligible	3,159	12.8
Not Eligible	7,711	31.2
Unknown Eligibility	5,111	20.7
Race/Ethnicity		
American Indian or Alaska Native	426	1.7
Asian	547	2.2
Black or African American	3,031	12.3
Hispanic or Latino	1,852	7.5
Multi-Racial	422	1.7
Native Hawaiian or Other Pacific Islander	193	0.8
White	17,503	70.8
Undefined	763	3.1
Course Taken		
Accounting	161	0.7
Career Planning	870	3.5
Civics	2,107	8.5
Consumer Math	3,283	13.3
Contemporary World Issues	380	1.5
Creative Writing	1,255	5.1
Drivers Safety	620	2.5
Economics	631	2.5
Family and Consumer Science	1,583	6.4
German	29	0.1
Health	1,696	6.9
Integrated Math	511	2.1
Japanese	147	0.6
Life Skills	1,719	6.9
Music Appreciation	838	3.4
Nutrition and Wellness	594	2.4
Personal Finance	791	3.2
Physical Education	4,991	20.2
Programming	64	0.3
Psychology	1,403	5.7
Sociology	598	2.4
Spanish	60	0.2
Web Design	406	1.6

The demographic profile of students taking an online credit recovery elective course is displayed below in the form of pie graphs to show the percentage of students with different demographic characteristics.

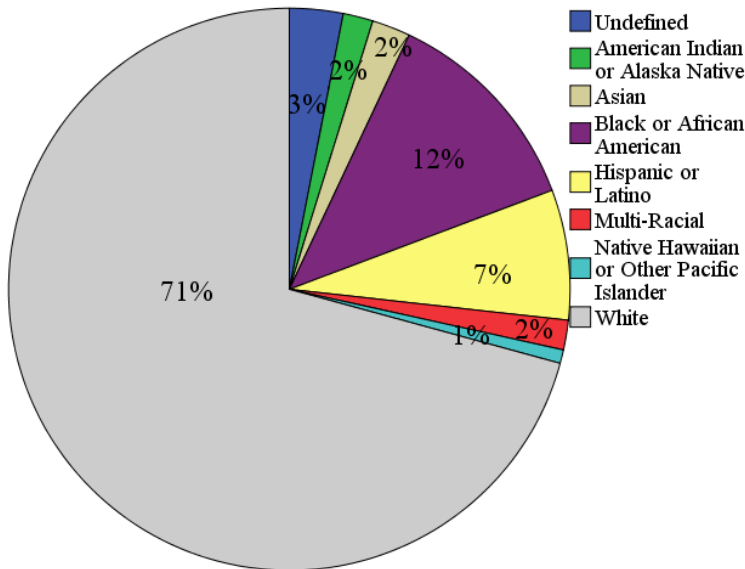
Student Gender Variable



Student Socioeconomic Status Variable



Student Race/Ethnicity Variable



Student Course Taken Variable

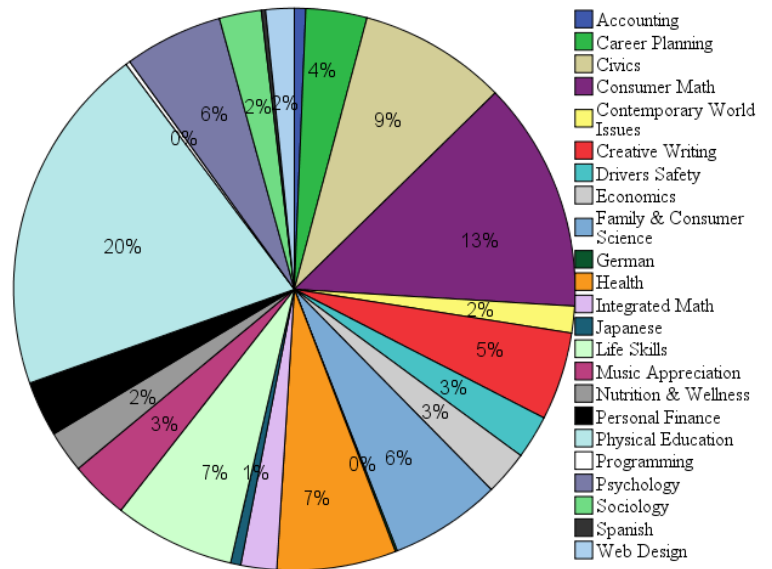


Figure 3. Demographic Profile for Students Taking an Elective Course

Research Question One and Hypotheses

Research question 1 was stated as follows: What percent of students who enroll in an online credit recovery core course regain lost credits? The nul hypothesis was: Online credit recovery has no effect on students in the recovery of lost credits in core courses. The alternative hypothesis was: Online credit recovery has an effect on students in the recovery of lost credits in core courses. The online content provider had 16,698 students take an online credit recovery core course during the 2012-2013 school year in the United States. A total of 9,326 (55.9%) students received a passing grade and 7,372 (44.1%) students received a failing grade. Table 4, below, shows the frequency and percent of students that passed or failed an online credit recovery core course during the 2012-2013 school year.

Table 4

Frequency Distribution of Students who took a Core Course

Variable	Descriptive Statistics	
	n	%
Students who Passed a Core Course	9,326	55.9
Students who Failed a Core Course	7,372	44.1
Total	16,698	100.0

When the researcher changed the dependent variable to number grade (A = 4, B = 3, C = 2, D = 1, F = 0), the resulting mean score for all students taking an online credit recovery core course was 1.22, which equates to a letter grade of D. The researcher then only considered students who received a passing grade (A = 4, B = 3, C = 2, D = 1) to calculate the mean score of students who passed an online credit recovery core course. The mean score for students who passed an online credit recovery course was 2.17, which equates to a letter grade of C.

Research Question Two and Hypotheses

Research question 2 was stated as follows: What difference is there in the student's final grade in an online credit recovery core course based on student gender? The nul hypothesis was: There is no difference between the student's final grade in an online credit recovery core course based on the student gender. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery core course based on the student gender.

The results of this research question were collected and analyzed using an independent samples *t*-test to compare the mean scores of female students and male students who took an online credit recovery core course. This test determined, on average, if a statistical difference exists between female and male student's final grade. The independent samples *t*-test was performed with pass/fail as the dependent variable to determine if a difference existed between pass rates for female and male students. The independent samples *t*-test was also performed with final number grade as the dependent variable to determine if a difference existed between final grade for female and male students. Before this test could be performed the researcher needed to establish whether the data for this variable were parametric or non-parametric. The use of parametric statistics and the ability to generalize to the sample population can be achieved when the data are normally distributed, have homogeneity of variance, and are continuous (Manly, 2005). If the data were considered non-parametric it does not satisfy one of the above mentioned assumptions. This determination can be performed by using the Levene's test. The Levene's test with pass/fail as the dependent variable and the Levene's test with number grade for the dependent variable verified that equal variances can be assumed because the *p*-value in both tests were less than $\alpha = .05$. For this reason, the results of the independent sample *t*-test output table were interpreted from the row of data labeled, "Equal variances assumed".

An independent-samples *t*-test was conducted to compare the mean pass rate for female and male students who took a core course. There was a significant difference in the scores for female (M=0.57, SD=0.495) and male (M=0.54, SD=0.498) students; $t(16,696) = 4.234, p < 0.000$. These results suggest that the mean pass rate for female students were higher and statistically different than that of male students. This comparison can be seen in the table 5 below.

Table 5

t-test Results Comparing Male and Female Pass Rate in a Core Course

	n	Mean	SD	t	df	p	Decision
Female	8,966	0.57	0.495	4.234**	16,696	.000	Reject the Null
Male	7,732	0.54	0.498				

** $p < 0.05$

Note. M = Mean. SD = Standard Deviation.

Figure 4 below shows the pass rate for females and males that took an online credit recovery core course.

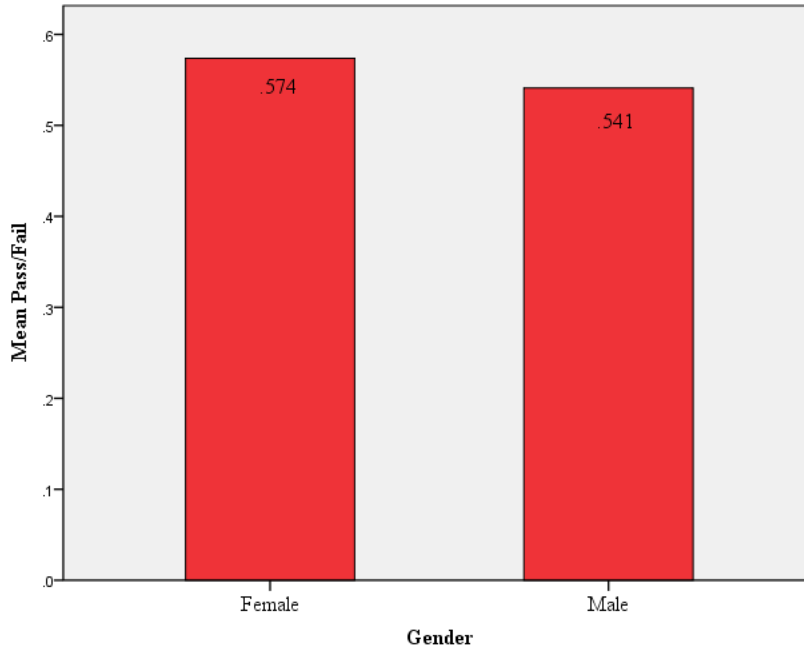


Figure 4. Mean Pass Rate for Female and Male Students in a Core Course

An independent-samples *t*-test was also conducted to compare final number grade (A = 4, B = 3, C = 2, D = 1, F = 0) for female and male students. There was a significant difference in the scores for female (M=1.27, SD=0.015) and male (M=1.15, SD=0.015) students; $t(16,696) = 5.614, p < 0.000$. These results suggest that the mean number grade values for female students were higher and statistically different than that of male students. These results also suggest that the average grade for female students (1.27) and male students (1.15) is equivalent to a letter grade just above that of D. This comparison can be seen in table 6 below.

Table 6

t-test Results Comparing Male and Female Number Grade in a Core Course

	n	Mean	SD	t	df	p	Decision
Female	8,966	1.27	1.384	5.614**	16,696	.000	Reject the Null
Male	7,732	1.15	1.323				

** $p < 0.05$

Note. M = Mean. SD = Standard Deviation. Letter grades were given numeric values as follows: A = 4, B = 3, C = 2, D = 1, F = 0.

Figure 5 below shows the number grade mean values for female and male students that took an online credit recovery core course.

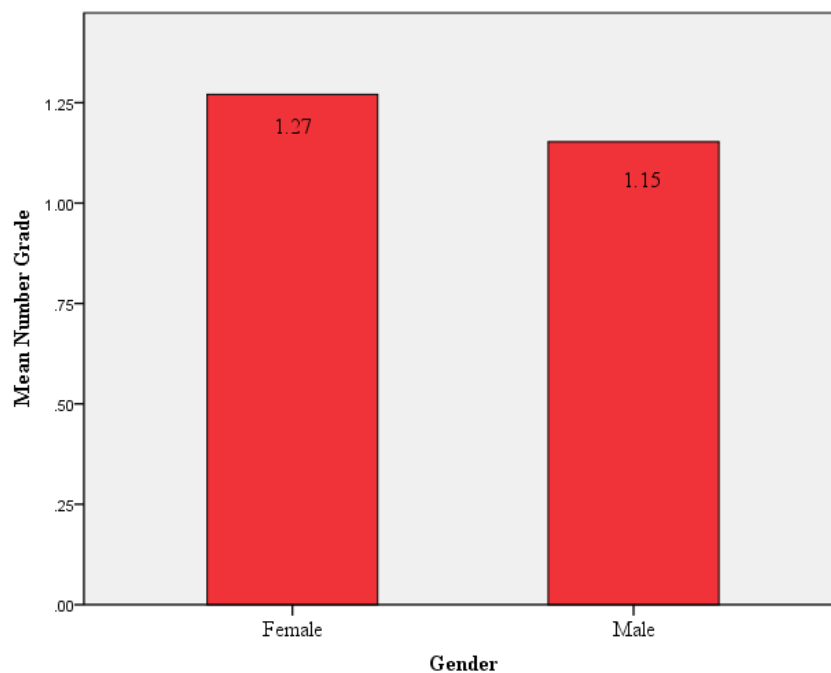


Figure 5. Mean Number Grade Values for Female and Male Students in a Core Course

Research Question Three and Hypotheses

Research question 3 was stated as follows: What difference is there in the student's final grade in an online credit recovery core course based on student socio-economic status? The null hypothesis was: There is no difference between the student's final grade in an online credit recovery core course based on the student socio-economic status. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery core course based on the student socio-economic status.

For this research question a one-way between subjects ANOVA was conducted to compare the difference socioeconomic status has on student's final grade in an online credit recovery core course for students eligible for free lunch, students eligible for reduced lunch, students not eligible for free/reduced lunch, and unknown eligibility. There was a significant difference between means at the $p < .05$ level for the four conditions [$F(3, 16,694) = 87.278, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the free lunch eligible students ($M = 0.51, SD = 0.50$) was significantly different than the reduced lunch eligible students ($M = 0.58, SD = 0.493$) and the students not eligible for free/reduced lunch ($M = 0.66, SD = 0.475$). Post hoc comparisons also revealed that the mean score for the students eligible for reduced lunch was significantly different than the students not eligible for free/reduced lunch and the students with unknown eligibility ($M = 0.53, SD = 0.499$). The mean score for students not eligible for free/reduced lunch was also statistically different than students with unknown eligibility. The difference between mean scores for students eligible for free lunch and students with unknown eligibility were not statistically significant. Taken together, these results suggest that a student's socioeconomic status has an effect on their final grade in an online credit recovery core course. Table 7 below shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 7

ANOVA Results for Socioeconomic Status of Students Taking a Core Course

ANOVA					
Pass/Fail	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63.580	3	21.193	87.278	.000

Within Groups	4053.756	16694	.243
Total	4117.336	16697	

Table 8 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 8

Tukey HSD Results for Socioeconomic Status of Students Taking a Core Course

Multiple Comparisons						
Dependent Variable: Pass/Fail						
Tukey HSD						
(I) Socioeconomic Status	(J) Socioeconomic Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Unknown Eligibility	Free Lunch Eligible	.020	.011	.260	-.01	.05
	Reduced Lunch Eligible	-.056*	.014	.000	-.09	-.02
	Not Eligible	-.129*	.012	.000	-.16	-.10
Free Lunch Eligible	Unknown Eligibility	-.020	.011	.260	-.05	.01
	Reduced Lunch Eligible	-.075*	.012	.000	-.11	-.04
	Not Eligible	-.149*	.010	.000	-.17	-.12
Reduced Lunch Eligible	Unknown Eligibility	.056*	.014	.000	.02	.09
	Free Lunch Eligible	.075*	.012	.000	.04	.11
	Not Eligible	-.074*	.013	.000	-.11	-.04
Not Eligible	Unknown Eligibility	.129*	.012	.000	.10	.16
	Free Lunch Eligible	.149*	.010	.000	.12	.17
	Reduced Lunch Eligible	.074*	.013	.000	.04	.11

*. The mean difference is significant at the 0.05 level.

The means plot below shows that the students not eligible for free/reduced lunch had the highest mean score, followed by reduced lunch students, unknown eligibility students, and free lunch students, respectively.

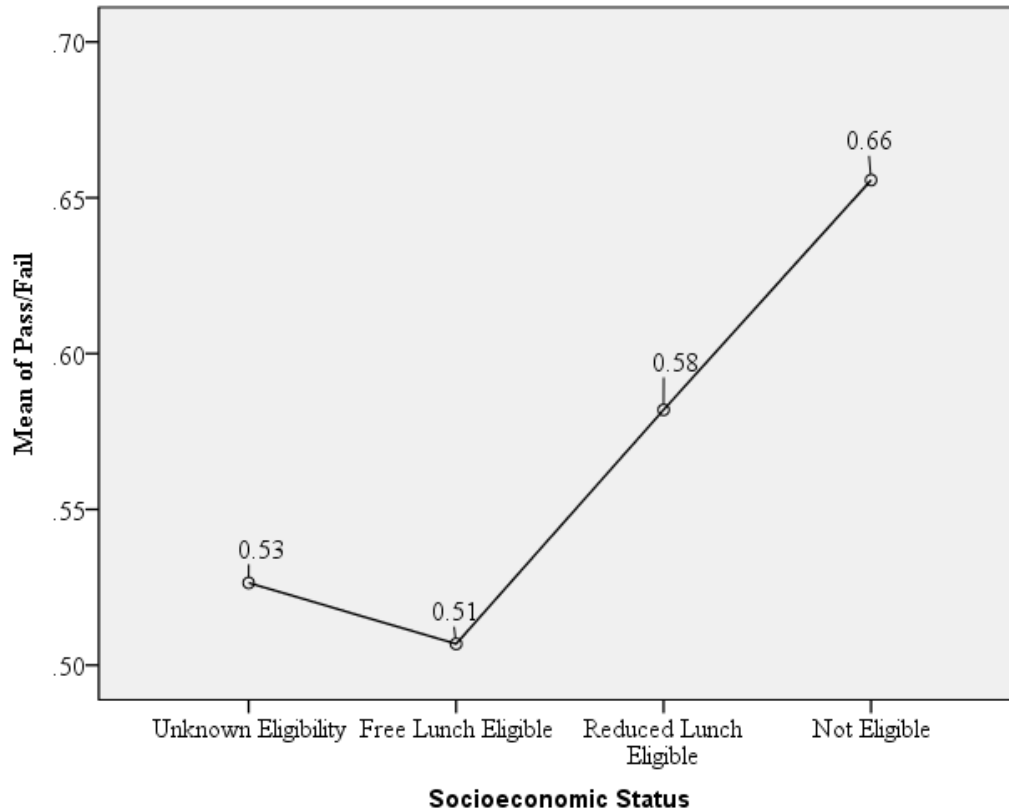


Figure 6. Means Plot Showing Pass Rate and Socioeconomic Status for Students Taking a Core Course

The means plot shows that 66% of the students not eligible for free/reduced lunch passed the online credit recovery core course. Fifty-eight percent of the students eligible for a reduced lunch passed the online credit recovery core course. Fifty-one percent of the students eligible for a free lunch passed the online credit recovery core course. Fifty-three percent of the student with unknown eligibility passed the online credit recovery core course.

Research Question Four and Hypotheses

Research question 4 was stated as follows: What difference is there in the student's final grade in an online credit recovery core course based on student race/ethnicity? The null hypothesis was: There is no difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity. The alternative hypothesis was: There

is a difference between the student's final grade in an online credit recovery core course based on the student race/ethnicity.

For this research question a one-way between subjects ANOVA was conducted to compare the difference race/ethnicity has on a student's final grade in an online credit recovery core course for American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Multi-Racial, Native Hawaiian or Other Pacific Islander, White or undefined students. There was a significant difference between means at the $p < .05$ level for the eight conditions [$F(7, 16,690) = 10.209, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for American Indian or Alaska Native students ($M = 0.46, SD = 0.499$) was significantly different than Asian students ($M = 0.66, SD = 0.476$), Hispanic or Latino students ($M = 0.57, SD = 0.495$), and White students ($M = 0.57, SD = 0.495$). Post hoc comparisons also revealed that the mean score for Asian students was significantly different than undefined students ($M = 0.45, SD = 0.498$), Black or African American students ($M = 0.53, SD = 0.499$), and Multi-Racial students ($M = 0.47, SD = 0.50$). The mean score for Black or African American students was also statistically different than undefined students and White students. The mean score for White students was statistically different than undefined students. The mean score for Native Hawaiian or Other Pacific Islander students ($M = 0.61, SD = 0.491$) was not significantly different when compared to any other race/ethnicity. These results suggest that a student's race/ethnicity has an effect on their final grade in an online credit recovery core course. Table 9 below shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 9

ANOVA Results for Race/Ethnicity for Students Taking a Core Course

ANOVA					
Pass/Fail					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17.555	7	2.508	10.209	.000
Within Groups	4099.781	16690	.246		
Total	4117.336	16697			

Table 10 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 10

Tukey HSD Results for Race/Ethnicity for Students Taking a Core Course

Multiple Comparisons						
Dependent Variable: Pass/Fail						
Tukey HSD						
(I)	(J) Race/Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Race/Ethnicity					Lower Bound	Upper Bound
Undefined	American Indian or Alaska Native	-.009	.034	1.000	-.11	.09
	Asian	-.202*	.036	.000	-.31	-.09
	Black or African American	-.078*	.022	.011	-.15	-.01
	Hispanic or Latino	-.119*	.025	.000	-.19	-.04
	Multi-Racial	-.017	.039	1.000	-.14	.10
	Native Hawaiian or Other Pacific Islander	-.155	.057	.114	-.33	.02
	White	-.116*	.021	.000	-.18	-.05
	American Indian or Alaska Native	Undefined	.009	.034	1.000	-.09
Asian	Black or African American	-.194*	.041	.000	-.32	-.07
	Black or African American	-.069	.029	.251	-.16	.02

	Hispanic or Latino	-.110*	.031	.011	-.20	-.02
	Multi-Racial	-.009	.044	1.000	-.14	.12
	Native Hawaiian or Other Pacific Islander	-.146	.060	.220	-.33	.04
	White	-.107*	.028	.003	-.19	-.02
	Undefined	.202*	.036	.000	.09	.31
	American Indian or Alaska Native	.194*	.041	.000	.07	.32
Asian	Black or African American	.124*	.032	.003	.03	.22
	Hispanic or Latino	.084	.034	.207	-.02	.19
	Multi-Racial	.185*	.046	.001	.05	.32
	Native Hawaiian or Other Pacific Islander	.047	.061	.994	-.14	.23
	White	.086	.031	.094	-.01	.18
	Undefined	.078*	.022	.011	.01	.15
	American Indian or Alaska Native	.069	.029	.251	-.02	.16
Black or African American	Asian	-.124*	.032	.003	-.22	-.03
	Hispanic or Latino	-.040	.018	.308	-.09	.01
	Multi-Racial	.061	.035	.676	-.05	.17
	Native Hawaiian or Other Pacific Islander	-.077	.054	.848	-.24	.09
	White	-.038*	.011	.011	-.07	-.01
	Undefined	.119*	.025	.000	.04	.19
	American Indian or Alaska Native	.110*	.031	.011	.02	.20
Hispanic or Latino	Asian	-.084	.034	.207	-.19	.02
	Black or African American	.040	.018	.308	-.01	.09
	Multi-Racial	.101	.037	.116	-.01	.21
	Native Hawaiian or Other Pacific Islander	-.036	.055	.998	-.20	.13
	White	.003	.016	1.000	-.04	.05
	Undefined	.017	.039	1.000	-.10	.14
	American Indian or Alaska Native	.009	.044	1.000	-.12	.14
Multi-Racial	Asian	-.185*	.046	.001	-.32	-.05
	Black or African American	-.061	.035	.676	-.17	.05
	Hispanic or Latino	-.101	.037	.116	-.21	.01

	Native Hawaiian or Other Pacific Islander	-.137	.063	.365	-.33	.05
	White	-.099	.034	.079	-.20	.01
	Undefined	.155	.057	.114	-.02	.33
	American Indian or Alaska Native	.146	.060	.220	-.04	.33
Native Hawaiian or Other Pacific Islander	Asian	-.047	.061	.994	-.23	.14
	Black or African American	.077	.054	.848	-.09	.24
	Hispanic or Latino	.036	.055	.998	-.13	.20
	Multi-Racial	.137	.063	.365	-.05	.33
	White	.039	.053	.996	-.12	.20
	Undefined	.116*	.021	.000	.05	.18
	American Indian or Alaska Native	.107*	.028	.003	.02	.19
	Asian	-.086	.031	.094	-.18	.01
White	Black or African American	.038*	.011	.011	.01	.07
	Hispanic or Latino	-.003	.016	1.000	-.05	.04
	Multi-Racial	.099	.034	.079	-.01	.20
	Native Hawaiian or Other Pacific Islander	-.039	.053	.996	-.20	.12

*. The mean difference is significant at the 0.05 level.

The means plot below shows that Asian students had the highest mean score, followed by Native Hawaiian or Other Pacific Islander students, White and Hispanic or Latino students, Black or African American students, Multi-Racial students, undefined students, and American Indian or Alaska Native students, respectively.

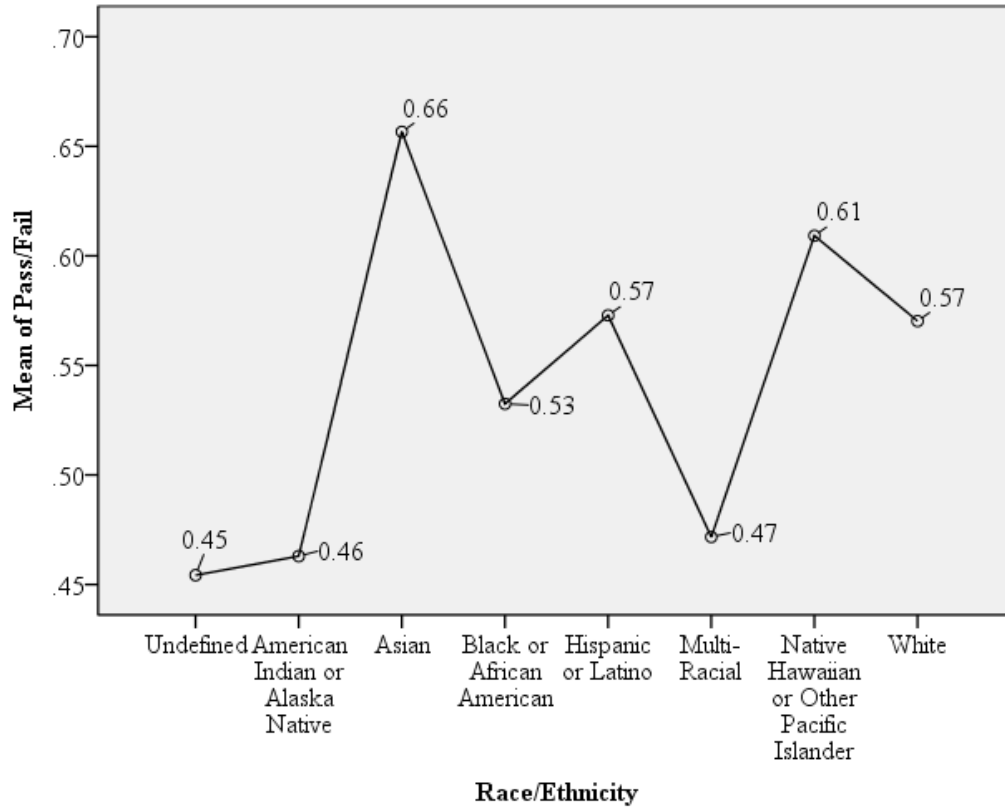


Figure 7. Means Plot Showing Pass Rate and Race/Ethnicity for Students Taking a Core Course

The means plot shows that 66% of Asian students passed the online credit recovery core course. Sixty-one percent of Native Hawaiian or Other Pacific Islander students passed the online credit recovery core course. Fifty-seven percent of White and Hispanic or Latino students passed the online credit recovery core course. Fifty-three percent of Black or African American students passed the online credit recovery core course. Forty-seven percent of Multi-Racial students passed the online credit recovery core course. Forty-six percent of American Indian or Alaska Native students passed the online credit recovery core course. Forty-five percent of the undefined students passed the online credit recovery core course.

Research Question Five and Hypotheses

Research question 5 was stated as follows: What difference is there in the student's final grade in an online credit recovery core course based on course taken? The nul hypothesis was: There is no difference between the student's final grade in an online credit recovery core course based on course taken. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery core course based on course taken.

For this research question courses were organized into academic disciplines to make the analysis more meaningful. All core courses were placed in one of the following academic disciplines: English, History and Social Science, Mathematics, and Science. A one-way between subjects ANOVA was conducted to compare the difference the course taken has on a student's final grade in an online credit recovery core course for students taking an English, History and Social Science, Mathematics, and Science course. There was a significant difference between means at the $p < .05$ level for the four conditions [$F(3, 16,694) = 97.344, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for students taking an English course ($M = 0.47, SD = 0.499$) was significantly different than students taking a History and Social Science course ($M = 0.64, SD = 0.479$), students taking a Mathematics course ($M = 0.55, SD = 0.498$), and students taking a Science course ($M = 0.58, SD = 0.493$). Post hoc comparisons also revealed that the mean score for students taking a History and Social Science course was significantly different than students taking a Mathematics course and students taking a Science course. The mean score for students taking a Mathematics course was also statistically different than students taking a Science course. These results suggest the course the student takes has an effect on their final grade in an online credit recovery core course. Table 11 below

shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 11

ANOVA Results for Course Taken for Students Taking a Core Course

ANOVA					
Pass/Fail					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	70.787	3	23.596	97.344	.000
Within Groups	4046.549	16694	.242		
Total	4117.336	16697			

Table 12 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 12

Tukey HSD Results for Course Taken for Students Taking a Core Course

Multiple Comparisons							
Dependent Variable: Pass/Fail							
(I) Discipline	(J) Discipline	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
					Lower Bound	Upper Bound	
English	History and Social Sciences	-.171*	.010	.000	-.20	-.14	
	Mathematics	-.076*	.010	.000	-.10	-.05	
	Science	-.111*	.012	.000	-.14	-.08	
History and Social Sciences	English	.171*	.010	.000	.14	.20	
	Mathematics	.095*	.010	.000	.07	.12	
	Science	.060*	.012	.000	.03	.09	
Mathematics	English	.076*	.010	.000	.05	.10	
	History and Social Sciences	-.095*	.010	.000	-.12	-.07	
	Science	-.035*	.012	.024	-.07	.00	
Science	English	.111*	.012	.000	.08	.14	
	History and Social Sciences	-.060*	.012	.000	-.09	-.03	
	Mathematics	.035*	.012	.024	.00	.07	

*. The mean difference is significant at the 0.05 level.

The means plot below shows that students taking a History and Social Science had the highest mean score, followed by students taking a Science course, students taking a Mathematics course, and students taking an English course, respectively.

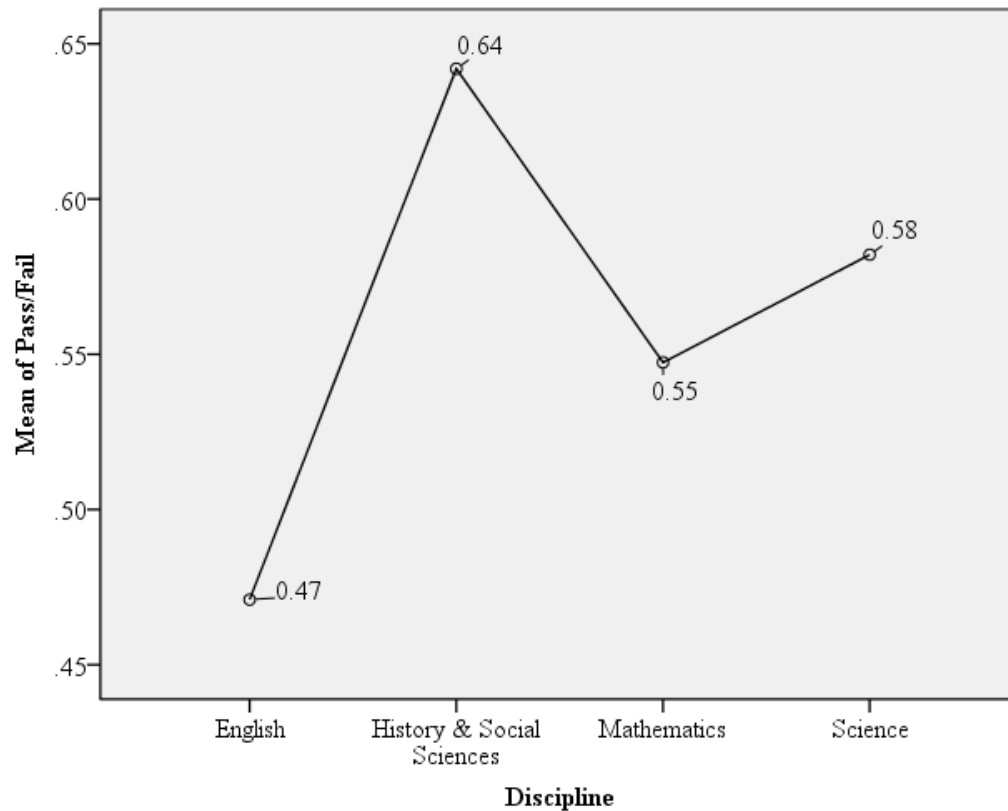


Figure 8. Means Plot Showing Pass Rate and Course Taken for Students Taking a Core Course

The means plot shows that 64% of students taking a History and Social Science course passed the online credit recovery core course. Fifty-eight percent of students taking a Science course passed the online credit recovery core course. Fifty-five percent of students taking a Mathematics course passed the online credit recovery core course. Forty-seven percent of students taking an English course passed the online credit recovery core course.

Research Question Six and Hypotheses

Research question 6 was stated as follows: What percent of students who enroll in an online credit recovery elective course regain lost credits? The nul hypothesis was: Online credit recovery has no effect on students in the recovery of lost credits in elective courses. The alternative hypothesis was: Online credit recovery has an effect on students in the recovery of lost credits in elective courses. The online content provider had 24,737 students take an online credit recovery elective course during the 2012-2013 school year in the United States. A total of 16,777 (67.8%) students received a passing grade and 7,960 (32.2%) students received a failing grade. Table 13, below, shows the frequency and percent of students that passed or failed an online credit recovery elective course during the 2012-2013 school year.

Table 13

Frequency Distribution of Students who took an Elective Course

Variable	Descriptive Statistics	
	n	%
Students who Passed an Elective Course	16,777	67.8
Students who Failed an Elective Course	7,960	32.2
Total	24,737	100.0

When the researcher changed the dependent variable to number grade (A = 4, B = 3, C = 2, D = 1, F = 0), the resulting mean score for all students taking an online credit recovery elective course was 1.83, which equates to a letter grade of D. The researcher then only considered students who received a passing grade (A = 4, B = 3, C = 2, D = 1) to calculate the mean score of students who passed an online credit recovery elective course. The mean score for students who passed an online credit recovery elective course was 2.69, which equates to a letter grade of C.

Research Question Seven and Hypotheses

Research question 7 was stated as follows: What difference is there in the student's final grade in an online credit recovery elective course based on student gender? The nul hypothesis was: There is no difference between the student's final grade in an online credit recovery elective course based on the student gender. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery elective course based on the student gender.

The results of this research question were collected and analyzed using an independent samples *t*-test to compare the mean scores of female and male students who took an online credit recovery elective course. This test determined, on average, if a statistical difference exists between female and male student's final grade in an online credit recovery elective course. The independent samples *t*-test was performed with pass/fail as the dependent variable to determine if a difference existed between pass rates for female and male students. The independent samples *t*-test was also performed with final number grade as the dependent variable to determine if a difference existed between final grade for female and male students. The Levene's test, to determine if the data were parametric or non-parametric, verified that equal variances can be assumed because the p-value in the test was less than $\alpha = .05$. For this reason, the results of the *t*-test output table were interpreted from the row of data labeled, "Equal variances assumed".

An independent-samples *t*-test was conducted to compare the final pass rate for female and male students who took an elective course. There was a significant difference in the scores for female ($M=0.7$, $SD=0.458$) and male ($M=0.64$, $SD=0.479$) students; $t(24,735) = 9.676$, $p <$

0.000. These results suggest that the mean pass rate for female students were higher and statistically different than that of male students. This comparison can be seen in table 14.

Table 14

t-test Results Comparing Male and Female Pass Rate in an Elective Course

	n	Mean	SD	t	df	p	Decision
Female	15,018	0.7	0.458	9.676**	24,735	.000	Reject the Null
Male	9,719	0.64	0.479				

**p < 0.05

Note. M = Mean. SD = Standard Deviation.

Figure 9 below shows the pass rate for female and male students that took an online credit recovery elective course.

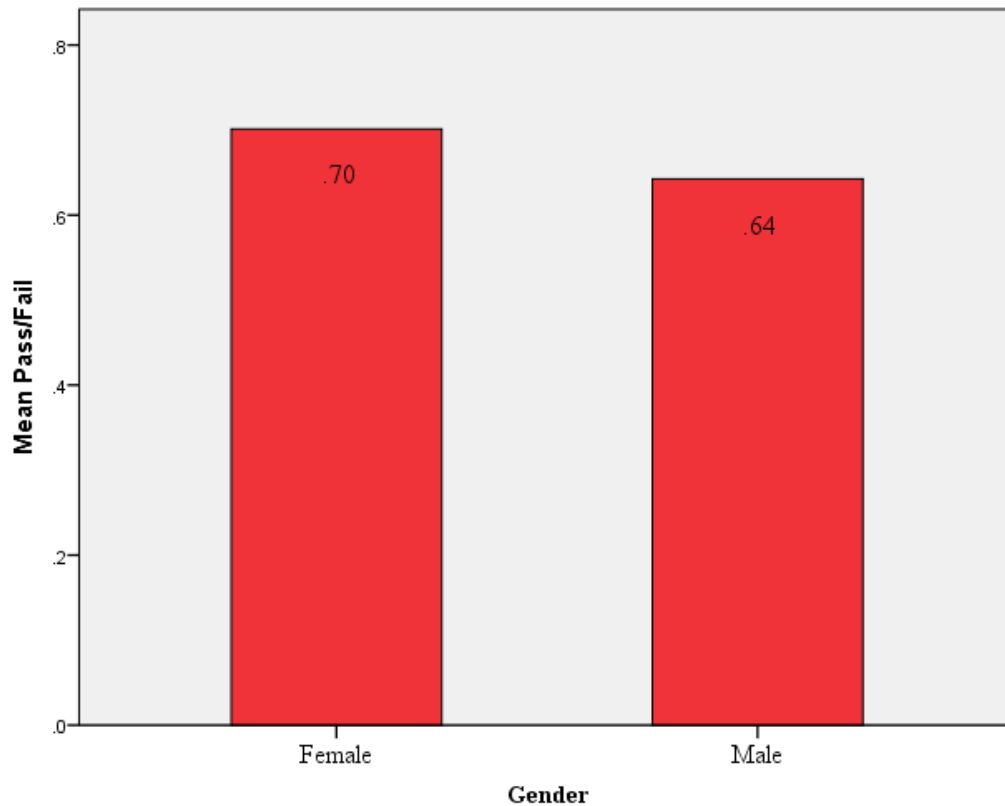


Figure 9. Mean Pass Rate for Female and Male Students in an Elective Course

An independent-samples *t*-test was also conducted to compare final number grade (A = 4, B = 3, C = 2, D = 1, F = 0) for female and male students taking an elective course. There was not a significant difference in the scores for female (M=1.92, SD=1.57) and male (M=1.69, SD=1.55) students; $t(24,735) = 11.245, p = 0.753$. These results suggest that the mean number grade values for female students were not statistically different than that of male students. These results suggest that the average grade for female students (1.92) and male students (1.69) is equivalent to a letter grade between C and D. This comparison can be seen in the table 15.

Table 15

t-test Results Comparing Male and Female Number Grade in an Elective Course

	n	Mean	SD	t	df	p	Decision
Female	15,018	1.92	1.570	11.245	24,735	.753	Fail to Reject the Null
Male	9,719	1.69	1.554				

** $p < 0.05$

Note. M = Mean. SD = Standard Deviation. Letter grades were given numeric values as follows:

A = 4, B = 3, C = 2, D = 1, F = 0.

Figure 10 below shows the number grade mean values for female and male students that took an online credit recovery elective course.

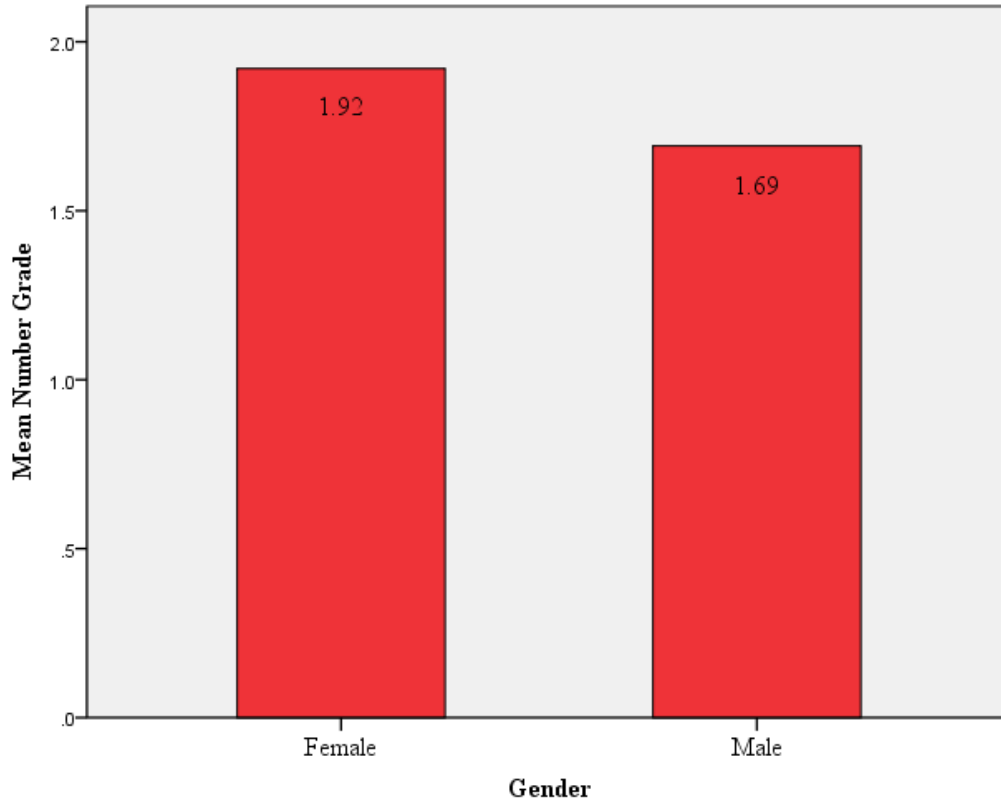


Figure 10. Mean Number Grade Values for Female and Male Students in an Elective Course

Research Question Eight and Hypotheses

Research question 8 was stated as follows: What difference is there in the student's final grade in an online credit recovery elective course based on student socio-economic status? The nul hypothesis was: There is no difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery elective course based on the student socio-economic status.

For this research question a one-way between subjects ANOVA was conducted to compare the difference socioeconomic status has on student's final grade in an online credit recovery elective course for students eligible for free lunch, students eligible for reduced lunch,

students not eligible for free/reduced lunch, and unknown eligibility. There was a significant difference between means at the $p < .05$ level for the four conditions [$F(3, 24,733) = 164.974, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the free lunch eligible students ($M = 0.60, SD = 0.489$) was significantly different than the reduced lunch eligible students ($M = 0.69, SD = 0.463$), the students not eligible for free/reduced lunch ($M = 0.76, SD = 0.424$), and the students with unknown eligibility ($M = 0.67, SD = 0.471$). Post hoc comparisons also revealed that the mean score for the reduced lunch students was significantly different than the students not eligible for free/reduced lunch. The mean score for students not eligible for free/reduced lunch was also statistically different than students with unknown eligibility. The mean score for students eligible for reduced lunch and students with unknown eligibility were not statistically significant. Taken together, these results suggest that a student's socioeconomic status has an effect on their final grade in an online credit recovery elective course. Table 16 below shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 16

ANOVA Results for Socioeconomic Status for Students Taking an Elective Course

ANOVA					
Pass/Fail	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63.580	3	21.193	87.278	.000
Within Groups	4053.756	16694	.243		
Total	4117.336	16697			

Table 17 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 17

Tukey HSD Results for Socioeconomic Status for Students Taking an Elective Course

Multiple Comparisons						
Dependent Variable: Pass/Fail						
Tukey HSD						
(I) Socioeconomic Status	(J) Socioeconomic Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Unknown Eligibility	Free Lunch Eligible	.063*	.008	.000	.04	.08
	Reduced Lunch Eligible	-.022	.010	.163	-.05	.01
	Not Eligible	-.097*	.008	.000	-.12	-.08
Free Lunch Eligible	Unknown Eligibility	-.063*	.008	.000	-.08	-.04
	Reduced Lunch Eligible	-.085*	.010	.000	-.11	-.06
	Not Eligible	-.160*	.007	.000	-.18	-.14
Reduced Lunch Eligible	Unknown Eligibility	.022	.010	.163	-.01	.05
	Free Lunch Eligible	.085*	.010	.000	.06	.11
	Not Eligible	-.075*	.010	.000	-.10	-.05
Not Eligible	Unknown Eligibility	.097*	.008	.000	.08	.12
	Free Lunch Eligible	.160*	.007	.000	.14	.18
	Reduced Lunch Eligible	.075*	.010	.000	.05	.10

*. The mean difference is significant at the 0.05 level.

The means plot below shows that the students not eligible for free/reduced lunch had the highest mean score, followed by reduced lunch students, unknown eligibility students, and free lunch students, respectively.

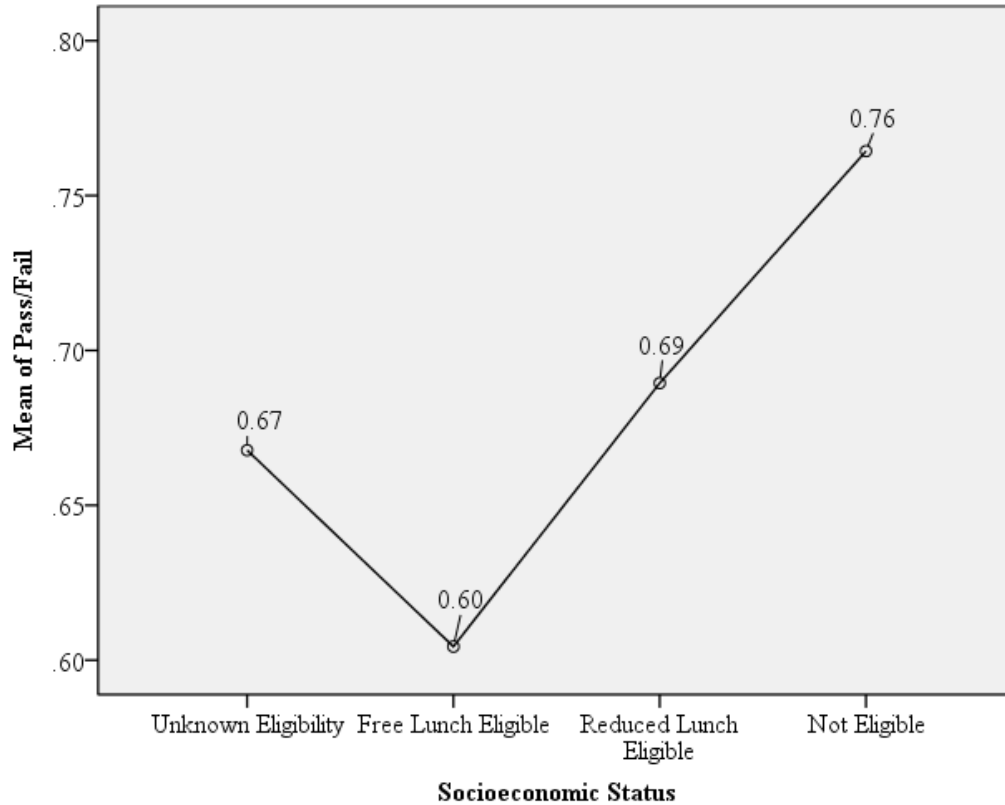


Figure 11. Means Plot Showing Pass Rate and Socioeconomic Status for Students Taking an Elective Course

The means plot shows that 76% of the students not eligible for free/reduced lunch passed the online credit recovery elective course. Sixty-nine percent of the students eligible for a reduced lunch passed the online credit recovery elective course. Sixty percent of the students eligible for a free lunch passed the online credit recovery elective course. Sixty-seven percent of the student with unknown eligibility passed the online credit recovery elective course.

Research Question Nine and Hypotheses

Research question 9 was stated as follows: What difference is there in the student's final grade in an online credit recovery elective course based on student race/ethnicity? The null hypothesis was: There is no difference between the student's final grade in an online credit

recovery elective course based on the student race/ethnicity. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery elective course based on the student race/ethnicity.

For this research question a one-way between subjects ANOVA was conducted to compare the difference race/ethnicity has on a student's final grade in an online credit recovery elective course for American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Multi-Racial, Native Hawaiian or Other Pacific Islander, White or undefined students. There was a significant difference between means at the $p < .05$ level for the eight conditions [$F(7, 24,729) = 22.686, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for American Indian or Alaska Native students ($M = 0.59, SD = 0.493$) was significantly different than Asian students ($M = 0.78, SD = 0.413$) and White students ($M = 0.69, SD = 0.460$). Post hoc comparisons also revealed that the mean score for Asian students was significantly different than undefined students ($M = 0.64, SD = 0.479$), Black or African American students ($M = 0.60, SD = 0.489$), Hispanic or Latino students ($M = 0.65, SD = 0.476$), Multi-Racial students ($M = 0.68, SD = 0.465$), Native Hawaiian or Other Pacific Islander students ($M = 0.60, SD = 0.491$), and White students. The mean score for Black or African American students was also statistically different than Hispanic or Latino students, Multi-Racial students and White students. The mean score for Hispanic or Latino students was statistically different than White students. These results suggest that a student's race/ethnicity has an effect on their final grade in an online credit recovery elective course. Table 18 below shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 18

ANOVA Results for Race/Ethnicity for Students Taking an Elective Course

ANOVA					
Pass/Fail					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34.447	7	4.921	22.686	.000
Within Groups	5364.143	24729	.217		
Total	5398.590	24736			

Table 19 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 19

Tukey HSD Results for Race/Ethnicity for Students Taking an Elective Course

Multiple Comparisons						
Dependent Variable: Pass/Fail						
Tukey HSD						
(I)	(J) Race/Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Race/Ethnicity					Lower Bound	Upper Bound
Undefined	American Indian or Alaska Native	.056	.028	.499	-.03	.14
	Asian	-.138*	.026	.000	-.22	-.06
	Black or African American	.041	.019	.355	-.02	.10
	Hispanic or Latino	-.007	.020	1.000	-.07	.05
	Multi-Racial	-.040	.028	.850	-.13	.05
	Native Hawaiian or Other Pacific Islander	.044	.038	.941	-.07	.16
	White	-.050	.017	.070	-.10	.00
	American Indian or Alaska Native	Undefined	-.056	.028	.499	-.14
Indian or Alaska Native	Asian	-.193*	.030	.000	-.28	-.10
	Black or African American	-.014	.024	.999	-.09	.06

	Hispanic or Latino	-.063	.025	.187	-.14	.01
	Multi-Racial	-.096	.032	.056	-.19	.00
	Native Hawaiian or Other Pacific Islander	-.012	.040	1.000	-.13	.11
	White	-.106*	.023	.000	-.17	-.04
	Undefined	.138*	.026	.000	.06	.22
	American Indian or Alaska Native	.193*	.030	.000	.10	.28
Asian	Black or African American	.179*	.022	.000	.11	.24
	Hispanic or Latino	.130*	.023	.000	.06	.20
	Multi-Racial	.098*	.030	.027	.01	.19
	Native Hawaiian or Other Pacific Islander	.181*	.039	.000	.06	.30
	White	.087*	.020	.000	.03	.15
	Undefined	-.041	.019	.355	-.10	.02
	American Indian or Alaska Native	.014	.024	.999	-.06	.09
Black or African American	Asian	-.179*	.022	.000	-.24	-.11
	Hispanic or Latino	-.049*	.014	.009	-.09	-.01
	Multi-Racial	-.081*	.024	.018	-.15	-.01
	Native Hawaiian or Other Pacific Islander	.002	.035	1.000	-.10	.11
	White	-.092*	.009	.000	-.12	-.06
	Undefined	.007	.020	1.000	-.05	.07
	American Indian or Alaska Native	.063	.025	.187	-.01	.14
Hispanic or Latino	Asian	-.130*	.023	.000	-.20	-.06
	Black or African American	.049*	.014	.009	.01	.09
	Multi-Racial	-.033	.025	.901	-.11	.04
	Native Hawaiian or Other Pacific Islander	.051	.035	.832	-.06	.16
	White	-.043*	.011	.004	-.08	-.01
	Undefined	.040	.028	.850	-.05	.13
	American Indian or Alaska Native	.096	.032	.056	.00	.19
Multi-Racial	Asian	-.098*	.030	.027	-.19	-.01
	Black or African American	.081*	.024	.018	.01	.15
	Hispanic or Latino	.033	.025	.901	-.04	.11

	Native Hawaiian or Other Pacific Islander	.084	.040	.434	-.04	.21
	White	-.010	.023	1.000	-.08	.06
	Undefined	-.044	.038	.941	-.16	.07
	American Indian or Alaska Native	.012	.040	1.000	-.11	.13
Native Hawaiian or Other Pacific Islander	Asian	-.181*	.039	.000	-.30	-.06
	Black or African American	-.002	.035	1.000	-.11	.10
	Hispanic or Latino	-.051	.035	.832	-.16	.06
	Multi-Racial	-.084	.040	.434	-.21	.04
	White	-.094	.034	.098	-.20	.01
	Undefined	.050	.017	.070	.00	.10
	American Indian or Alaska Native	.106*	.023	.000	.04	.17
	Asian	-.087*	.020	.000	-.15	-.03
White	Black or African American	.092*	.009	.000	.06	.12
	Hispanic or Latino	.043*	.011	.004	.01	.08
	Multi-Racial	.010	.023	1.000	-.06	.08
	Native Hawaiian or Other Pacific Islander	.094	.034	.098	-.01	.20

*. The mean difference is significant at the 0.05 level.

The means plot below shows that Asian students had the highest mean score, followed by White students, Multi-Racial students, Hispanic or Latino students, undefined students, Black or African American and Native Hawaiian or Other Pacific Islander students, and American Indian or Alaska Native students, respectively.

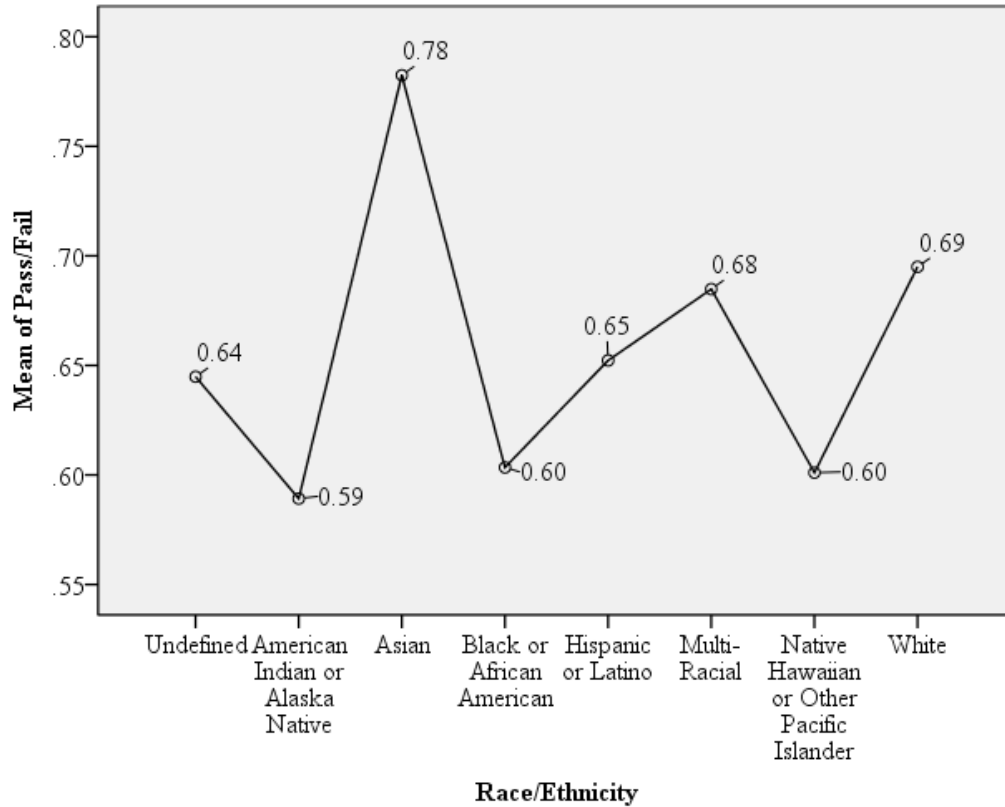


Figure 12. Means Plot Showing Pass Rate and Race/Ethnicity for Students Taking an Elective Course

The means plot shows that 78% of Asian students passed the online credit recovery elective course. Sixty-nine percent of White students passed the online credit recovery elective course. Sixty-eight percent of Multi-Racial students passed the online credit recovery elective course. Sixty-five percent of Hispanic or Latino students passed the online credit recovery elective course. Sixty-four percent of undefined students passed the online credit recovery elective course. Sixty percent of Black or African American and Native Hawaiian or Other Pacific Islander students passed the online credit recovery elective course. Fifty-nine percent of American Indian or Alaska Native passed the online credit recovery elective course.

Research Question Ten and Hypotheses

Research question 10 was stated as follows: What difference is there in the student's final grade in an online credit recovery elective course based on course taken? The nul hypothesis was: There is no difference between the student's final grade in an online credit recovery elective course based on course taken. The alternative hypothesis was: There is a difference between the student's final grade in an online credit recovery elective course based on course taken.

For this research question courses were organized into academic disciplines to make the analysis more meaningful. All elective courses were placed in one of the following academic disciplines: Career Technical Education, English, Fine Arts, History and Social Sciences, Life and Career Planning, Mathematics, Physical Education, and World Languages. A one-way between subjects ANOVA was conducted to compare the difference the course taken has on a student's final grade in an online credit recovery elective course for students taking a Career Technical Education, English, Fine Arts, History and Social Sciences, Life and Career Planning, Mathematics, Physical Education, and World Languages course. There was a significant difference between means at the $p < .05$ level for the eight conditions [$F(7, 24,729) = 24.048, p < .000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for students taking a Career and Technical Education course ($M = 0.47, SD = 0.500$) was significantly different than students taking an English elective course ($M = 0.71, SD = 0.455$), students taking a Fine Arts course ($M = 0.66, SD = 0.474$), and students taking a History and Social Science elective course ($M = 0.69, SD = 0.464$), students taking a Life and Career Planning course ($M = 0.66, SD = 0.472$), students taking a Mathematics elective course ($M = 0.72, SD = 0.451$), students taking a Physical Education course ($M = 0.67, SD = 0.471$), and

students taking a World Language course ($M = 0.69$, $SD = 0.465$). Post hoc comparisons also revealed that the mean score for students taking a Mathematics course was significantly different than students taking a Fine Arts course, History and Social Science course, Life and Career Planning course and students taking a Physical Education course. These results suggest the course the student takes has an effect on their final grade in an online credit recovery elective course. Table 20 below shows a p-value less than .05 signifying that a difference exists between the means of the test groups.

Table 20

ANOVA Results for Course Taken for Students Taking an Elective Course

ANOVA					
Pass/Fail	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36.502	7	5.215	24.048	.000
Within Groups	5362.088	24729	.217		
Total	5398.590	24736			

Table 21 below shows the results of the Tukey HSD post hoc test and which means differ significantly signified by the values followed with an asterisk.

Table 21

Tukey HSD Results for Course Taken for Students Taking an Elective Course

Multiple Comparisons						
Dependent Variable: Pass/Fail						
Tukey HSD						
(I) Discipline	(J) Discipline	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound

	English	-.233*	.023	.000	-.30	-.16
	Fine Arts	-.187*	.025	.000	-.26	-.11
Career	History and Social Sciences	-.213*	.019	.000	-.27	-.15
Technical	Life and Career Planning	-.190*	.021	.000	-.25	-.13
Education	Mathematics	-.243*	.020	.000	-.30	-.18
	Physical Education	-.193*	.019	.000	-.25	-.13
	World Languages	-.213*	.036	.000	-.32	-.10
	Career Technical Education	.233*	.023	.000	.16	.30
	Fine Arts	.046	.021	.352	-.02	.11
	History and Social Sciences	.020	.014	.860	-.02	.06
English	Life and Career Planning	.042	.016	.139	-.01	.09
	Mathematics	-.010	.015	.998	-.05	.04
	Physical Education	.040	.014	.084	.00	.08
	World Languages	.020	.033	.999	-.08	.12
	Career Technical Education	.187*	.025	.000	.11	.26
	English	-.046	.021	.352	-.11	.02
	History and Social Sciences	-.026	.017	.804	-.08	.03
Fine Arts	Life and Career Planning	-.003	.019	1.000	-.06	.05
	Mathematics	-.056*	.017	.032	-.11	.00
	Physical Education	-.005	.017	1.000	-.06	.05
	World Languages	-.025	.034	.996	-.13	.08
	Career Technical Education	.213*	.019	.000	.15	.27
	English	-.020	.014	.860	-.06	.02
History and	Fine Arts	.026	.017	.804	-.03	.08
Social	Life and Career Planning	.022	.011	.425	-.01	.06
Sciences	Mathematics	-.030*	.009	.019	-.06	.00
	Physical Education	.020	.008	.146	.00	.04
	World Languages	.000	.031	1.000	-.09	.09
	Career Technical Education	.190*	.021	.000	.13	.25
	English	-.042	.016	.139	-.09	.01
Life and	Fine Arts	.003	.019	1.000	-.05	.06
Career	History and Social Sciences	-.022	.011	.425	-.06	.01
Planning	Mathematics	-.052*	.011	.000	-.09	-.02
	Physical Education	-.002	.011	1.000	-.03	.03
	World Languages	-.022	.032	.997	-.12	.07
	Career Technical Education	.243*	.020	.000	.18	.30
Mathematics	English	.010	.015	.998	-.04	.05

	Fine Arts	.056*	.017	.032	.00	.11
	History and Social Sciences	.030*	.009	.019	.00	.06
	Life and Career Planning	.052*	.011	.000	.02	.09
	Physical Education	.050*	.009	.000	.02	.08
	World Languages	.030	.031	.978	-.06	.12
Physical Education	Career Technical Education	.193*	.019	.000	.13	.25
	English	-.040	.014	.084	-.08	.00
	Fine Arts	.005	.017	1.000	-.05	.06
	History and Social Sciences	-.020	.008	.146	-.04	.00
	Life and Career Planning	.002	.011	1.000	-.03	.03
	Mathematics	-.050*	.009	.000	-.08	-.02
	World Languages	-.020	.031	.998	-.11	.07
World Languages	Career Technical Education	.213*	.036	.000	.10	.32
	English	-.020	.033	.999	-.12	.08
	Fine Arts	.025	.034	.996	-.08	.13
	History and Social Sciences	.000	.031	1.000	-.09	.09
	Life and Career Planning	.022	.032	.997	-.07	.12
	Mathematics	-.030	.031	.978	-.12	.06
	Physical Education	.020	.031	.998	-.07	.11

*. The mean difference is significant at the 0.05 level.

The means plot below shows that students taking a Mathematics elective course had the highest mean score, followed by students taking an English elective course, students taking a History and Social Science elective course, World Language course, Physical Education course, Fine Arts course, Career and Life Planning course and students taking a Career Technical Education course, respectively.

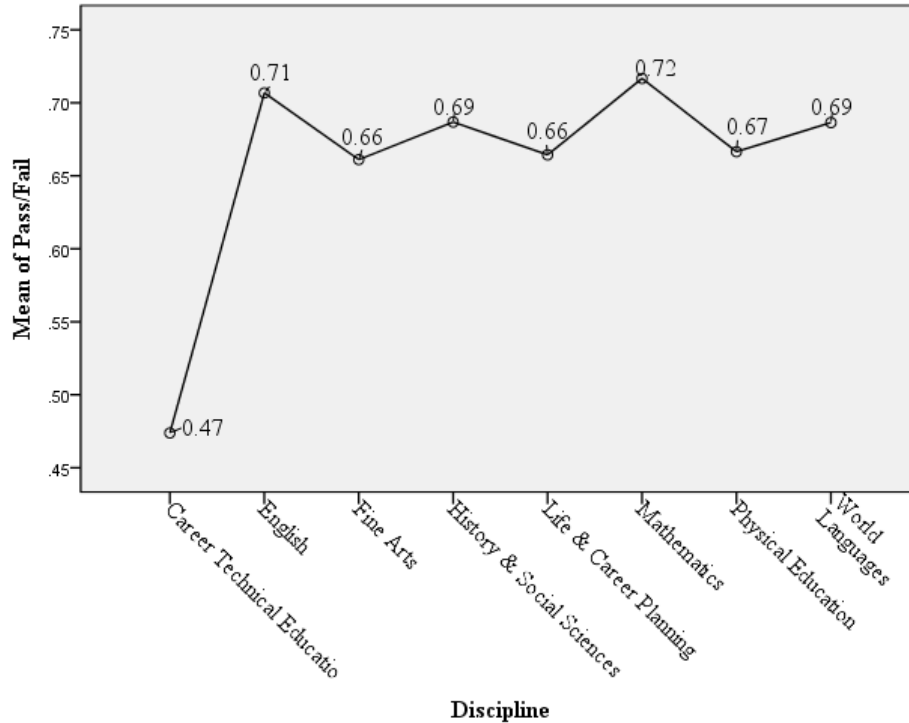


Figure 13. Means Plot Showing Pass Rate and Course Taken for Students Taking an Elective Course

The means plot shows that 72% of students taking a Mathematics elective course passed the online credit recovery elective course. Seventy-one percent of students taking an English elective course passed the online credit recovery elective course. Sixty-nine percent of students taking a History and Social Science and World Language course passed the online credit recovery elective course. Sixty-seven percent of students taking a Physical Education course passed the online credit recovery elective course. Sixty-six percent of the students taking a Fine Arts and Life and Career Planning course passed the online credit recovery elective course. Forty-seven percent of the students that took a Career Technical Education course passed the online credit recovery elective course.

Chapter Four Summary

This chapter provided information on the demographic profile of the sample for students taking a core course and the demographic profile of the sample for students taking an elective course. The research questions along with the associated hypotheses were systematically presented and the results were exhibited in narrative and graphic form. Tables, graphs and plots were used to convey the results of the study. The statistical methods or tests in which the data were analyzed for each research question were outlined. The chapter concluded with a chapter four summary.

Chapter Five: Findings, Implications, and Recommendations

Chapter five reveals the findings, implications, and recommendations for future study. The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on a student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses. This study utilized a quantitative comparative design to determine if differences exist between success in online credit recovery core courses and student's gender, socio-economic status, race/ethnicity, and course taken. This study also evaluated if differences exist between success in online credit recovery elective courses and student's gender, socio-economic status, race/ethnicity, and course taken. An ex post facto non-experimental approach was used because the pre-existing data were provided by an online content provider. This study analyzed 41,435 students throughout the United States that took a course for the purposes of credit recovery during the 2012-2013 school year. This design revealed the degree to which gender, socio-economic status, race/ethnicity, and course taken play in successful completion of an online credit recovery core course and an online credit recovery elective course. The relationship between student demographic factors and the student's online credit recovery final grade should be indicative for instructional leaders as they initiate online credit recovery programs and as they determine which students are suited for this instructional method. This chapter reflects upon the data collected to determine the major findings and implications of the study that are relevant to educational leaders. The chapter continues with recommendations for future research and concludes with reflections on the study.

Summary of Findings

The data analysis process of this study revealed many findings related to online credit recovery that educational leaders should find relevant when considering alternatives for students at risk of dropping out. The findings of the study are presented below:

Finding one. More than half of the students who took an online credit recovery course, either core or elective, received a passing grade and recovered lost credit. The online content provider had 41,445 students take an online credit recovery course during the 2012-2013 school year and 26,103 students received a passing grade. This is a total pass rate of 62.98% for the entire sample size. The pass rate was disaggregated for students taking a core course and students taking an elective course. The online content provider had 16,698 students take an online credit recovery core course during the 2012-2013 school year in the United States. A total of 9,326 students or 55.9% of the students in the study received a passing grade when attempting a core course. The online content provider had 24,737 students take an online credit recovery elective course during the 2012-2013 school year in the United States. A total of 16,777 students or 67.8% of students in the study received a passing grade when attempting an elective course.

Prior research states that effective help for students at risk of dropping out should include repeated opportunities for struggling students to meet high standards. Bottoms (1987) recommends engaging students in rigorous and challenging assignments using research-based instructional strategies and technology. Bridgeland (2007) suggests providing supportive options for struggling students to meet rigorous expectations. Dynarski (2008) finds that

students who fail to pass required courses need support to catch up on both academic skills and credit accumulation.

Finding two. The total number of female students taking an online credit recovery course was greater than the total number of male students. Fifty-eight percent of the total sample or 23,984 students were females. Of the 16,698 students who took an online credit recovery core course during the 2012-2013 school year in the United States, 8,966 or 53.7% were female students. Fifteen thousand eighteen or 60.7% of the students who took an online credit recovery elective course during the same school were female students.

This finding is comparable to the gap seen between male and female student graduation rates. Among all races and ethnicities, males graduate at a lower rate than their female peers (Education Week, 2011). This indicates female students are graduating at a higher rate. This may also indirectly indicate that female students are more inclined to be receptive to interventions, specifically online credit recovery.

Finding three. A higher percentage of female students were successful in an online credit recovery course compared to their male counterparts for both core and elective courses. The data analysis revealed that 57% of female students taking a core course in the study received a passing grade compared to 54% of male students taking a core course. Female students taking an online credit recovery core course had a mean number grade of 1.27 and male students taking an online credit recovery core course had a mean number grade of 1.15. Seventy percent of female students received a passing grade in an elective course compared to 64% of male students. Female students taking an online credit recovery elective course had a mean

number grade of 1.92 and male students taking an online credit recovery elective course had a mean number grade of 1.69.

This finding is consistent with prior research. Education Week (2013) reported that 72 percent of male students earn a diploma compared with 78 percent of female students, a gender gap of 6 percentage points that has remained virtually unchanged for years. In 2011, among all races and ethnicities, males graduate at a lower rate than their female peers. In 2011, there was a 7-point gender gap between males and females, with 68 percent of males and 75 percent of females earning a high school diploma on time. Minority males consistently fall below the 50 percent mark for graduating on time (Education Week, 2011).

Finding four. The majority of students who took an online credit recovery course were eligible for free or reduced lunch. Of the 41,435 students in the study, 21,355 or 51.5% were eligible for free or reduced lunch. It is important to mention that 8,120 students in the study listed their free/reduced lunch status as unknown. The number of student eligible for free/reduced lunch that took an online credit recovery core course was 9,440 and the number of students eligible for free/reduced lunch that took an online credit recovery elective course was 11,915.

Research suggests that high-poverty schools lack the capacity to substantially improve student learning, independent of financial resources (Jacob & Ludwig, 2009). This would imply that less-affluent students would lack access to academic interventions that significantly improve student academic outcomes; however, the results of this study show that over half of the students accessing online credit recovery courses are eligible for free or reduced lunch.

Finding five. A higher percentage of students not eligible for free/reduced lunch received a passing grade in an online credit recovery course than the percentage of students eligible for free or reduced lunch. Sixty-six percent of students in the study not eligible for free/reduced lunch received a passing grade in a core course compared to 58% of students eligible for reduced lunch and 51% of students eligible for a free lunch. Seventy-six percent of students in the study not eligible for free/reduced lunch received a passing grade in an elective course compared to 69% of students eligible for a reduced lunch and 60% of students eligible for a free lunch.

This finding is consistent with prior research. Poor students (bottom 20 percent of all family incomes) are five times more likely to drop out of high school than high-income students (top 20 percent of all family incomes) (Chapman, Laird, Ifill, & KewalRamani, 2011). A student's community plays a role in predicating their likelihood of dropping out of school. Students living in more affluent neighborhoods tend to graduate at a higher rate than students living in a high-poverty neighborhood (Rumberger, 2008).

Finding six. A majority of students taking an online credit recovery course are White. A total number of 28,986 of the students in the study listed their race/ethnicity as White. Students listed as White make up 69.9% of the total number of students in the study. Eleven-thousand four-hundred and eighty-three of the students taking a core course and 17,503 of the students taking an elective course listed their race/ethnicity as White.

It is important that researchers and practitioners continue to design interventions that affect particular populations. Finding best practices for all students may not be serving all students. Inadvertent discrimination may hinder minority students' progress and may negatively

affect their persistence (Carter, 2006). This finding suggests that online credit recovery may be an effective intervention for all students; however, it may not be an intervention specifically suited for underperforming minority students.

Finding seven. All students, regardless of race/ethnicity, passed at a rate equal to or greater than 46 percent. The mean pass rate for all ethnicities was 59.6% with a low of 46% for students of American Indian or Alaska Native descent taking a core course and a high of 78% for students of Asian descent taking an elective course.

Research shows that graduation rates vary considerably between different race/ethnicities. The United States Department of Education recently reported in the National School report card that Asian/Pacific Islander students have a graduation rate of 77%, White students have a rate of 75%, Black students have a rate of 50%, Hispanic students have a 53% graduation rate, and Native American/Alaskan students have a rate of 51% (United States Department of Education, 2013). Because all students, regardless of ethnicity/race, are passing online credit recovery courses at a rate greater than 45% it may be concluded that online credit recovery will increase graduation rates for students of all race and ethnicities.

Finding eight. Students taking an English course had the lowest pass rate when considering all core courses. Students taking a mathematics or science course received a passing grade 55% and 58% of the time, respectively. Students taking an English course online via credit recovery received a passing grade 47% of the time. The highest pass rate for students taking a core course was History and Social Sciences at 64%.

Research has shown that students in the United States perform poorly on the Program for International Student Assessment (PISA) in the areas of science and mathematics. The

United States ranked 30th in mathematics and 23rd in science when compared to other countries. Students in the United States perform better in reading where we rank 20th (The Organization for Economic Co-operation and Development, 2012). Recent Science, Technology, Engineering, and Mathematics (STEM) initiatives show that the United States is considering these rankings a cause for concern. Students in need of STEM-related course credits may be candidates for online credit recovery given the results of the study.

Finding nine. Students taking a Career and Technical Education course had the lowest pass rate when considering all elective courses. The means plot shows that 72% of students taking a Mathematics elective course passed the online credit recovery elective course. Seventy-one percent of students taking an English elective course passed the online credit recovery elective course. Sixty-nine percent of students taking a History and Social Science and World Language course passed the online credit recovery elective course. Sixty-seven percent of students taking a Physical Education course passed the online credit recovery elective course. Sixty-six percent of the students taking a Fine Arts and Life and Career Planning course passed the online credit recovery elective course. Forty-seven percent of the students that took a Career Technical Education course passed the online credit recovery elective course. The Career Technical Education courses in the study were Accounting, Programming, and Web Design.

Research suggests that dropout prevention programs should incorporate career/technical studies and provide intellectually challenging career/technical options (Bottoms, 1987). Effective dropout prevention programs give students an opportunity to pursue relevant career and technical education options. Balfanz (2009) suggests establishing a rigorous college and work preparatory curriculum for high school graduation when addressing high school dropouts. A

work preparatory curriculum in the 21st century public schools often means access to career and technical education courses. Lehr (2004) found that effective dropout prevention programs have a work related (e.g. vocational training) focus.

Finding ten. Most students taking an online credit recovery course took an elective course to regain lost credit. Twenty-four thousand seven-hundred thirty-seven students of the 41,435 students in the study took an elective course to regain lost credit. This equates to 59.7% of students in the study who received credit via online credit recovery took an elective course.

Graduation requirements usually consist of a total number of credits needed to graduate and a specific number of credits needed in certain content areas. For example, in Virginia students are expected to gain 22 total credits to graduate and 4 credits must be in English. In this study there was a difference of 11.9% in the pass rate for students taking a core course and students taking an elective course. Nearly 68% of the students taking an elective course passed compared to nearly 56% of students taking a core course. Students that had the option of taking an elective course versus a core course did so according to the results of the study.

Implications

The findings from this study lead to the following implications for educational leaders to assess when considering implementing an online credit recovery program for students at risk of dropping out of school. The implications from this study are as follows:

Implication one. Instructional leaders should offer online credit recovery courses as a viable option for students at risk of dropping out of high school and/or students in need of regaining lost credits. The findings showed that 55.9% of the 16,698 students in the study

received a passing grade in a core course and 67.8% of the 24,737 students in the study received a passing grade in an elective course. Research has shown that students who miss or fail academic courses are at greater risk of dropping out of school than their peers. All students in this study failed their course in a traditional setting on the first attempt and nearly 63% of the students passed the course on their second attempt when utilizing online credit recovery. To re-engage these students researchers recommend that schools provide extra academic support (Dynarski, Clarke, Cobb, Finn, Rumberger, & Smink, 2008). The findings of this study suggest that extra academic support, which has most recently come in the form of credit recovery, is an effective alternative.

Implication two. Instructional leaders planning to implement an online credit recovery program should explore additional modifications or interventions that support male students. The results of this study showed female students performed 3 percentage points higher than male students in core courses and 6 percentage points higher than male students in elective courses. This falls in line with previous research sighting a gender gap of 6 percentage points that has remained virtually unchanged for years with 78 percent of females and 72 percent of males graduating on-time in 2011 (Education Week, 2013). Research has shown that adult tutoring, mentoring services and parent-inclusive activities have had significant results for male students (Bandy, 2012). Pairing an at-risk male student with an adult role model who can assist with online credit recovery may provide positive outcomes.

Implication three. Instructional leaders planning to implement an online credit recovery program should take additional measures to make this instructional method available to students on free/reduced lunch. A majority of the 41,435 students that

participated in the study were eligible for free or reduced lunch. Recent research has shown that economically disadvantaged students have less access to effective teaching (Isenberg et. al, 2013). According to the results of Isenberg et. al. (2013) the average disparity in teaching effectiveness was equivalent to about four weeks of learning for reading and two weeks for math in one school year. The results of this study show that online credit recovery is an effective instructional method and access does not appear to be a great challenge for economically disadvantaged students.

Implication four. Instructional leaders planning to implement an online credit recovery program should incorporate support systems that consider the needs of students on free/reduced lunch. The findings showed 66% of students not eligible for free/reduced lunch in the study received a passing grade in a core course and 76% received a passing grade in an elective course. Fifty-eight percent of students eligible for reduced lunch received a passing grade in a core course and 69% received a passing grade in an elective course. Fifty-one percent of students eligible for a free lunch received a passing grade in a core course and 60% of students eligible for a free lunch received a passing grade in an elective course. These findings are consistent with research conducted by Chapman, Laird, Ifill, & KewalRamani, (2011) which states poorer students (bottom 20 percent of all family incomes) are five times more likely to drop out of high school than high-income students (top 20 percent of all family incomes). Research has shown that the most effective interventions for economically disadvantaged students come in the early grades through programs like preschool (Colvin, 2010); however, fostering a safe, supportive, and responsive academic environment in the upper grades has shown to be effective (Balfanz et. al. 2010). Online credit recovery programs that incorporate strong

adult/student relationships may provide the support economically disadvantaged students need to successfully complete high school.

Implication five. Instructional leaders planning to implement an online credit recovery program should provide additional support for students taking English classes.

The results of this study showed that English courses proved to be more difficult to pass than mathematic or science courses. This may be due to the method of content delivery in an online instructional environment and the structured nature of mathematic or science subject matter.

Many of the interventions found to be available for special education students, such as reading the material to the student, giving the student extra time, and incorporating graphic organizers may help online credit recovery students become more successful in English courses. Possible consideration should be given to the content in the English courses. Students have shown to be more successful in literature-based classes if the material is relevant and meaningful.

Trachtenburg (1990) states that “if we wish to stimulate the imagination, provide stimulating language models, expose students to lucid discourse, and expand their cultural awareness, we need quality, meaningful literature”

Implication six. Instructional leaders planning to use online credit recovery for students in need of a Career and Technical Education (CTE) credit should provide extra support mechanisms that aid students in successfully completing the course. The 2012

Virginia General Assembly passed legislation that states, requirements for the standard diploma shall include a requirement to earn a career and technical education credential that has been approved by the Virginia Board of Education (VDOE, 2012). Based on findings in the study, that showed students taking a Career and Technical Education course in an online credit

recovery environment only passed 47% of the time, online credit recovery for students needing a Career and Technical education course may need additional supports to successfully earn credit. Research on Career and Technical Education course interventions reveals the need to accommodate the student in the experiential aspects of the curriculum. To meet the needs of Career and Technical Education students, educational leaders should employ numerous means to improve retention and completion, including common interventions such as bridge programs, first-year programs, cohorts, tutoring, and mentoring programs, alone or in combination with other programs (Manning & Everett, 2008; Scrivener, Sommo, & Collado, 2009).

Implication seven. Instructional leaders exploring credit opportunities for students at risk of dropping out of high school should offer online credit recovery elective and core courses as possible options. The results of the study showed the pass rate for students taking an online credit recovery elective course was 67.8% compared to 55.9% for students taking an online credit recovery core course. Students that are in need of acquiring lost credits in non-core courses are strongly recommended to enroll in an online credit recovery elective course where the pass rate is higher than that of core courses. Typically graduation requirements list a total number of credits needed to graduate and the number of credits needed to graduate in particular content areas. Based on the results of the study, if students need additional credits, that are not course specific, than there is a stronger likelihood that students will pass an elective course when compared to a core course.

Considerations for Future Research

The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on a student's gender, socio-economic status, race/ethnicity, and

course taken. Based on a review of the available literature and analysis obtained from the study the following considerations are made for future research related to the effectiveness of online credit recovery for students at risk of dropping out of high school:

- A comparative study measuring the differences between direct instruction and instruction received in an online credit recovery course could offer educational leaders a perspective on the benefits and drawbacks of both instructional environments. This study would also be beneficial to educational leaders who are assessing the value of traditional credit recovery models such as summer school when compared to online credit recovery.
- For the purposes of this study one online content provider was used to maintain a level of consistency and to remove variability found through the use of multiple online content providers. For future research, a study that considers the effectiveness of online credit recovery for students at risk of dropping out of high school through the analysis of multiple online content providers would be informative to educational leaders. The results would allow for comparison between online content providers and would allow the researcher to draw conclusions on the successful characteristics of each online credit recovery program.
- The findings from this study may serve as a useful framework for how to conduct similar research on other populations of students in need of recovering lost credits in an online credit recovery course. Focus on special populations of students, such as special education and English language learners (ELL), would provide insight into the unique needs of these students in this instructional environment. A study on special populations of students may also provide useful information on the adaptations and modifications needed for particular students to be successful in an online credit recovery environment.

- Qualitative research on the perceptions of students earning credits in an online credit recovery environment would offer an in-depth analysis of the opinions, motivations, and challenges of students performing in this instructional environment.
- Future research should focus on the correlation between online credit recovery courses and the results of end-of-course assessments. Students at risk of dropping out are often in need of passing required end-of-course assessments. A study on the end-of-course assessment pass rate compared to the online credit recovery course pass rate would offer insight into student's preparedness for end-of-course assessments after taking an online credit recovery course.

Reflections

The purpose of this study was to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on a student's gender, socio-economic status, race/ethnicity, and course taken. This study analyzed these differences in respect to core and elective online credit recovery courses. The conceptual framework for this study proposed that students that showed poor academic performance in a traditional instructional environment may reengage in their studies through online credit recovery and as a result acquire foundational skills and earn credits towards graduation. It is hoped that this study informs instructional leaders, who are dedicated to the promotion of student learning and the quality of instruction, on the emerging trends in dropout prevention and the effectiveness of online credit recovery programs.

The results of this study show that online credit recovery is an effective instructional method for students in need of recovering lost credits. The findings show there is a relatively high rate of success for students taking an online credit recovery elective and/or core course. As

is similar in previous research, females outperformed male students, and more affluent students performed better than less fortunate students. Hispanic and Black students in this study received a passing grade at a rate comparable to White students taking an online credit recovery course. Students taking a math or science online credit recovery course passed at a higher rate than students taking English courses in this study. The study also showed that students taking a career technical education course passed at a lower rate than students taking any other course. Finally, students taking an online credit recovery elective course were more likely to receive a passing grade compared to a student taking an online credit recovery core course.

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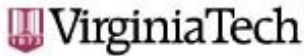
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Appendix A: IRB Certificate of Completion Training in Human Subjects Protection



Appendix B: Institutional Review Board (IRB) Approval



Office of Research Compliance
Institutional Review Board
North End Center, Suite 4120, Virginia Tech
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-4606 Fax 540/231-0959
email irb@ut.edu
website <http://www.irb.ut.edu>

MEMORANDUM

DATE: August 12, 2014
TO: Carol S Cash, Jesse Travis Boyd
FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)
PROTOCOL TITLE: Online Credit Recovery as an Effective Intervention for American Students at Risk of Dropping Out of High School
IRB NUMBER: 14-798

Effective August 12, 2014, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date: **August 12, 2014**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

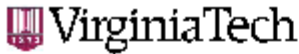
Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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An equal opportunity, affirmative action institution

Appendix C: Letter Requesting Use of Data



Virginia Tech Richmond Center
2810 North Parham Road
Richmond, Virginia 23294
(804) 662-7288

July 10, 2014



To [REDACTED]:

I am writing in hopes of establishing an agreement with [REDACTED] for a projected doctoral research study through Virginia Polytechnic Institute and State University. The purpose of my study is to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on specific student characteristics. This information will provide educational leaders with valuable insight regarding online credit recovery and the viability of credit recovery programs for students at risk of dropping out of high school.

All information in the study will be anonymous. Only research-specific identification numbers representing students need to be given to the researcher. No data identifying individual students are needed for this study. Also, at your request, I will only refer to [REDACTED] as an online content provider, keeping your company anonymous as well.

To implement and complete this study, I will need permission to analyze information gathered by [REDACTED]. I will need access, in the form of a spreadsheet, to student data such as gender, year in high school, age, socio-economic status, race/ethnicity, course taken, and final grade in credit recovery course.

After gaining approval by the Institutional Review Board (IRB), I will begin analyzing [REDACTED] data and I will be happy to offer copy of the final dissertation to [REDACTED] upon completion of my defense.

Thank you,

Jesse Boyd

cc: Dr. Carol Cash, Clinical Assistant Professor Virginia Tech
Dr. Greg Smith, Superintendent Richmond County Public Schools

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An equal opportunity, affirmative action institution

Appendix D: Research Agreement

RESEARCH AGREEMENT BETWEEN

████████████████████

AND

JESSE BOYD

This agreement (“Agreement”) is made this 14th day of July, 2014 (the “Effective Date”), by and between ████████████████████ and Jesse Boyd, with an address of 6914 Richmond Road, Warsaw, VA 22572 (“Student”), each individually a “Party” and collectively the “Parties.”

SCOPE

1.1 Student will be undertaking research for his own educational requirements to determine the extent to which online credit recovery is effective at allowing students to regain lost credits and to determine any differences that may exist in credit recovery based on specific student characteristics” (the “Study”). As part of the Study, ████████████████████ will provide student aggregate information in the form of a spreadsheet the following information 1) gender, 2) socio-economic status, race/ethnicity, course taken and final grade in the credit recovery act (collectively, “Information”). Student is permitted to use the Information for the sole purpose of completing the Study.

1.2 Student understands that he will not be given access to any “education records,” as that term is defined in the Family Educational Rights to Privacy Act.

RELATIONSHIP OF THE PARTIES

2.1 Nothing in this Agreement is intended to create an employment relationship, company, partnership, joint venture, association or other legal entity of any kind or for any purpose as between the Parties. No Party will have any authority to bind or commit the other Party, or cause the other Party to incur any liability or obligation, for any purpose without the express written consent of the other Party and either Party has the right to enter into the same or similar relationships with other Parties.

RIGHT TO PUBLISH

3.1 ████████████████████ understands that results or other information based in whole or in part on the Study may be embodied in Student’s final dissertation or such other document as is necessary for Student to complete his doctoral research study through Virginia Polytechnic Institute and State University (collectively, “Presentations and Publications”). If, however, any Presentations and Publications contain ████████████████████-Identifying Information, ████████████████████ must be furnished notice including copies of any proposed Presentations and Publications at least four (4) weeks in advance of the earlier of their publication or submission to a third party. ████████████████████ shall have two (2) weeks after receipt of said copies, to object, in its sole discretion, to the use of the ████████████████████-Identifying Information. In the event that ████████████████████ makes such objection, Student shall remove from such Presentations and Publications the ████████████████████-Identifying Information. ████████████████████-

Identifying Information shall mean all information, either by itself or in combination with other publicly available information, from which a person could reasonably be expected to be able to identify [REDACTED].

3.2 Student will comply with any request by [REDACTED] that the following statement be included in any publication related to the Study: "The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of [REDACTED]."

INTELLECTUAL PROPERTY AND OTHER AGREEMENTS

4.1 Nothing in this Agreement is intended to transfer, grant, deny, license or provide permission with respect to any rights in any intellectual property of a Party to this Agreement.

PROTECTION OF HUMAN SUBJECTS PARTICIPANTS

5.1 In accepting this agreement, Student warrants that the participation of all human subjects in this research project has been reviewed and approved by the cognizant Institutional Review Board in accordance with DHHS Regulations (45 CFR, Part 46). The Principle Investigator assigned for directing the performance of work of the Study is Carol Cash. If, for any reason, that person is no longer the Principle Investigator, Student shall notify [REDACTED] as soon as practicable but, in any event, within thirty (30) days thereafter, of the name of the new Principle Investigator.

TERM AND TERMINATION

6.1 This Agreement shall terminate 180 days from the Effective Date set forth above. Notwithstanding the forgoing, this Agreement can be terminated a) at any time for material breach upon provision of written notice and an opportunity to cure not to exceed 30 days, or b) for any reason upon one (1) month written notice, in which case reasonable efforts shall be made to minimize disruption of the Study.

USE OF NAME AND PUBLIC ANNOUNCEMENTS

7.1 Student shall not use the name of [REDACTED] or any of its affiliates, including any of its related logos, in any publication, without the prior written approval of [REDACTED].

LIABILITY

8.1 Student agrees to accept the responsibility for injury or damage to any person or persons or property that arise out of Student's negligent acts or omissions in connection with this Agreement.

WARRANTIES AND REPRESENTATIONS

9.1 Neither Party guarantees any specific results of the Study.

9.2 Student represents that she understands that any grade, evaluation or degree she receives in connection with the Study is based solely on her own work and that [REDACTED] bears no responsibility for any such grade, evaluation or degree.

9.3 THERE ARE NO WARRANTIES, CONDITIONS, COVENANTS OR REPRESENTATIONS (EXPRESSED OR IMPLIED) INCLUDING WITHOUT LIMITATION THE FITNESS OF A PARTICULAR PUPOSE, OR MERCHANABILITY GRANTED BY EITHER PARTY IN THIS AGREEMENT.

OTHER OBLIGATIONS

10.1 Non-Assignment. Student shall not have the right to assign any duty or responsibility arising hereunder without the prior written consent of [REDACTED]. Any assignment without such consent is void from its beginning.

10.2 Notices. All notices shall be in writing mailed via certified mail, return receipt requested, or by reputable overnight courier addressed as follows, or to such other address as may be designated from time to time. If to [REDACTED], to the Executive Vice President of School Services at the address set forth above. If to the Student, to her at the address set forth above. Notices shall be deemed given as of the date received.

10.3 Entire Agreement/Modification. This Agreement constitutes the entire agreement between the parties and may be amended only in writing signed by all parties.

10.4 Waiver. The failure of either party to enforce any of the provisions hereof will not be construed to be a waiver of the right of such party thereafter to enforce such provisions or any other provisions.

10.5 Severability. If any provision of this Agreement is declared void, such provision will be deemed severed from this Agreement, which will otherwise remain in full force and effect.

10.6 Survival. Sections 3.1, 3.2, 4.1, 4.2 and 8.1 of this Agreement survive the termination of the Agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives.

JESSE BOYD



By:

Date: 7/14/14

[REDACTED]

By: [REDACTED]

Title: [REDACTED]

Date: [REDACTED]