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## The Effectiveness of Accelerated Learning on Student Achievement in Developmental Courses offered at a Rural Community College

Anika Z. Floyd

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The effectiveness of accelerated learning on student achievement  
in developmental courses offered at a rural community college

By

Anika Z Floyd

A Dissertation  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy  
in Community College Leadership  
in the Department of Educational Leadership

Mississippi State, Mississippi

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2017

The effectiveness of accelerated learning on student achievement  
in developmental courses offered at a rural community college

By

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The purpose of this study was to examine the effect of the accelerated course learning format on student achievement in developmental English and math courses offered at a rural community college. Due to a rise in the number of underprepared students who enroll in community college, some college officials implemented the accelerated course learning format to allow students to complete developmental coursework in a shorter timeframe. Research on the utilization of the accelerated learning format in developmental education has been conducted in urban areas, and this study provides research and findings from a rural perspective.

Historical enrollment data were used to find out if the accelerated course learning format method of instruction increased a student's developmental course success and college-level persistence. The enrollment of students enrolled in at least 1 developmental English or math course offered in an accelerated or traditional format during the fall 2010 through fall 2015 enrollment period was tracked to evaluate success and persistence.

A non-experimental, comparative research design was used to evaluate the relationship between 1 independent variable (method of instruction: traditional or

accelerated) and 2 dependent variables (success: grade of A, B, or C and persistence: proceeded to and successfully completed the college level course: English Composition I and College Algebra). The data collected were analyzed using IBM *SPSS version 24.0*. Descriptive statistics were also used to analyze the data, and Chi Square tests were used to determine how well the experiential distribution of data fits with the distribution that was anticipated with the independent variables.

In reviewing the findings, results were consistent for each developmental course, in English and math. Students enrolled in 8-week courses consistently outperformed students enrolled in 16-week courses. Recommendations for future research include a review of students who withdrew and a discussion of demographics to determine if students withdrew because it was too fast. Another recommendation is to evaluate students who repeated courses and changed formats.

## DEDICATION

This study is dedicated in loving memory of my great-grandmother, Dona Blue Washington, who has always supported me and encouraged me to work hard and to be all that I can be. I also dedicate this work to my grandchildren: Kamryn Draughn, Kacey Draughn, and Zane Lofton. My prayer for my current and any future grandchildren is that they develop a love for learning and that they work hard to achieve their goals.

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## CHAPTER I

### INTRODUCTION

Community colleges are known to be “open-door” institutions. The students that they serve range from recent high school graduates to older adults who for various reasons decide to return to college. The percentage of students who require at least one level of developmental coursework is high and will more than likely increase. In addition, the number of students who begin on a developmental level and persist to successfully complete college-level work is even more of a concern. Recent research indicates that at least 60% of high school graduates who enroll in community college do not possess the academic skills needed to successfully complete college courses (Horn & Nevill, 2006). The Achieving the Dream initiative utilized an analysis of 80 community colleges was formulated to identify ways to help community college students succeed. Data from the project concluded that only 40% of students who were referred to developmental education courses completed the entire sequence, and almost half did not complete their first developmental course (Bailey, Jeong & Cho, 2010).

Although the aim of developmental courses is to assist students in obtaining the skills needed to be successful in college courses, some institutions reported that developmental students spend at least one year completing the developmental coursework (Parsad & Lewis, 2003). In most instances, the more levels of developmental courses a student is required to complete, the less likely it is that the student will persist to

complete the college-level courses needed to transfer or graduate (Hern, 2010). As a result, a significant number of community college administrators have sought ways to assist students in obtaining the skills needed, and at the same time keep the students on the path to graduate in a timely manner. In an effort to meet the needs of underprepared students, many community colleges offer accelerated courses.

Accelerated courses are offered for the same amount of units or credits, but the course length is different. Pascarella and Terenzini (2005) discovered that the amount of student contact with peers and faculty members are linked to student learning. Astin (1999) stated that “a highly involved student is one who devotes considerable energy into studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students” (p. 518). Astin’s (1985) Theory of Student Involvement is centered on the idea that students learn more when they are involved in academic and social aspects of college. In addition, Pascarella’s (1985) General Causal Model for Assessing the Effects of Differential College Environments on Student Learning and Cognitive Development evaluated student change while reflecting on the effects of an institution’s structural characteristics and environment. The model suggests that the quality and level of effort made by the student along with the amount of contact with the instructor have an effect on student learning and cognitive development (Pascarella, 1985). The sets of variables in Pascarella’s (1985) model are “student background/pre-college traits, structural/organizational characteristics, institutional environments, interactions with socialization, and quality of student effort” (p. 27). These variables also play an instrumental role in evaluating and determining reasons for student retention and withdrawal (Pascarella & Terenzini, 2005).

The relationships and outcomes of the accelerated method have been researched in several different states. The FastStart Accelerated project conducted at the Community College of Denver (CCD) evaluated acceleration in developmental English, math, and reading courses. Students enrolled in the Faststart program had the opportunity to complete two developmental courses in one semester instead of taking one course the entire semester. Additionally, in California, studies on acceleration in developmental education were conducted at Los Medanos College and Chabot College. Research from the studies concluded that a reduction in the number of courses and the length of time contributes to more student success (Hern & Dewitt, 2010).

It is noteworthy to mention that the majority of the studies conducted on acceleration were conducted in community colleges in urban areas. In contrast, this study seeks to examine the effect of the accelerated course learning format on student achievement in developmental courses from a rural community college perspective. The findings can be utilized as a resource to assist community colleges in rural areas with their course planning, course structuring, retention efforts, and graduation rates.

### **Statement of the Problem**

The problem examined in this study is that the more levels of developmental courses a student is required to complete, the less likely it is that the student will persist to complete college-level courses needed to be eligible to graduate or transfer. “The multiplication principle,” developed by Myra Snell of Los Medanos College, indicates that multiple levels of developmental courses are detrimental to students because they reduce the students’ chances of persisting through the college level work (Hern, 2010).

## **Purpose of the Study**

The purpose of this study was to examine the effect of the accelerated course learning format on student achievement in developmental English and math courses offered at a rural community college. Specifically, the purpose was to utilize historical enrollment data to find out if the accelerated course learning format method of instruction increased a student's developmental course success and college-level persistence. Since acceleration is being researched and evaluated in urban areas, this study provides data that can be utilized by college administrators in rural areas. In addition, the results can be used as a resource for developmental education course planning and structuring in rural colleges.

## **Research Questions**

1. Is there a statistically significant difference between traditional and accelerated course delivery methods on student success (grades) in developmental courses for both English and mathematics?
2. Is there a statistically significant difference between traditional and accelerated course delivery methods on student persistence in college level courses for both English and mathematics?
3. Is student success (grade: A, B, or C) in English Composition I significantly related to the number of developmental courses a student is required to take?
4. Is student success (grade: A, B, or C) in College Algebra significantly related to the number of developmental courses a student is required to take?

### **Delimitations**

There are at least two delimitations of the study. The first delimitation is that data will be collected from only one rural community college. The second delimitation involves the historical enrollment data which will only include the fall 2010 through fall 2015 timeframe.

### **Significance of the Study**

This study will help to determine if accelerated learning is an effective learning format in developmental courses offered at rural community colleges. The research will help to fill in the gaps of existing literature by providing data from a rural community college perspective. The findings can assist college faculty and administrators in course planning and structuring. The findings may also provide an avenue to improve student success and retention rates which should also improve graduation rates.

### **Definition of Terms**

1. Accelerated Learning – a method of instruction structured for students to take less time to complete a course; allowing two courses to be completed in one semester.
2. Developmental Courses – (also referred to as remedial courses) – non-credit courses that prepare students for college-level work.
3. Persistence – the ability of a student to proceed to and successfully complete the college level course (College Algebra and English Composition I).
4. Retention- the number of students who start in the class and are able to proceed and successfully complete the next course.

5. Success – the ability of a student to complete coursework, assignments and tests to earn a minimum final grade of C or better in developmental courses.
6. Traditional Learning – a method of instruction structured in a standard face-to-face classroom setting designed for students to complete one class per semester.

## CHAPTER II

### REVIEW OF LITERATURE

This chapter includes an overview of developmental education. It also highlights acceleration and discusses some articles and dissertations studied on the topic.

#### **Community College Developmental Education Overview**

Community colleges provide educational opportunities to individuals of varying ages, races, and abilities. Vaughn (2000) stated that community college students include “men and women who work full-time and part-time, people from all walks of life and of diverse racial and ethnic backgrounds, unemployed and underemployed individuals, and recent high school graduates” (p. 15). The open admissions policy at community colleges makes education attainable for many people who might not otherwise attempt to achieve an education. Jenkins and Boswell (2002) stated that “as open-door institutions, community colleges have long had to educate students who are not prepared for college-level work” (p. 4). The students in need of remediation range from recent high school graduates to older adults returning to college after many years of being in the workforce.

Approximately 60% of incoming students are referred to at least one developmental course (Bailey, 2009). In addition to those statistics, results from a 2003 survey conducted by the National Center for Education Statistics (NCES) on the percentage of students enrolled in remedial coursework showed that 28% of first-year students who entered 2- or 4-year postsecondary institutions were enrolled in remedial

courses in both 1995 and 2000” (Parsad & Lewis 2003). Statistics from the American College Testing program indicate that 34% of students are not prepared for English; 57% are not prepared for mathematics; and 48% are not prepared for reading. Statistics such as these play a major role in the offering of developmental courses in both community colleges and universities. Developmental courses are found in over 90% of the nation’s community colleges and about 70% of our universities (Boylan, Bonham, Claxton, & Bliss, 1992). Through the years, the percentage of developmental courses offered has increased in both college settings. Data from the U.S. Department of Education’s NCES (2009) revealed that 99.6% of all degree-granting 2-year public institutions and 74.5% of all 4-year degree granting institutions offered developmental courses.

### **Achievement in Developmental Education (Success and Retention)**

Student retention is a major element in today’s community colleges. Seidman (2005) describes retention as student attainment of academic and personal goals, regardless of how many terms a student is at the college. As colleges begin to seek ways to increase graduation rates, developmental education has become under an extensive evaluation. Since students enrolled in developmental education courses are underprepared and are considered unequipped for college education, they pose a risk to the colleges’ graduation rates. In some instances, students who do not pass the beginning phases of developmental education typically do not earn a degree. Estimations by Cross (1976) indicated that only 10% of developmental students who attend college are likely to earn a degree without some type of interference.

In the article *Rethinking Student Retention in Community Colleges*, Wild and Ebbers (2002) expound upon retention and explain that although it is important to study

the academically accepted models of Astin (1999) and Pascarella and Terenzini (2005) that have been established for student retention in universities, it is critical to consider the evolving research on student retention in community colleges. Jenkins, Jaggars and Roksa (2009) offered what some might consider a far-reaching solution to retention. The group points out that an evaluation of extensive studies revealed that students who bypass the recommended developmental placement altogether and enroll in the college-level course have almost the same success rate as those who actually completed the developmental sequence. In Bailey's (2010) *Achieving the Dream* study, an assessment was conducted on English and math completion rates in 57 colleges. The results revealed that the rate of completion decreases with each level of remedial course work required. In addition, Bailey (2010) found that of students who bypassed the developmental sequence, about 72% of the students who went to college-level courses passed the course, whereas only about 27% of those who complied with the developmental referral completed the college-level course.

In addition, Adelman (1998) found that the more remedial courses students are required to take, the less likely they are to earn degrees. Forty-five percent (45%) of students who earned more than 10 credits at a 2- and/or 4-year institution and took two remedial courses earned either an associate or bachelor's degree by the time they were 30. This is compared to 60% of students who took no remedial courses. Furthermore, Blöse (1999) found that the biggest differences between institutions in terms of persistence and graduation rates is the amount of time it takes to earn a degree, suggesting that low graduation rates might be the result of aspects of the institution that impede academic

progress, including course availability and scheduling and problems in the advising process.

### **Accelerated Learning**

Accelerated learning is not a brand new concept. Scott and Conrad (1992) noted that present day intensive courses evolved from several antecedents including summer sessions, interim sessions, modular calendar systems, weekend colleges, and foreign language training programs developed during World War II. Accelerated learning is described as a course being delivered in less time than a normal class (Daniel, 2000; Davies, 2006). Wlodkowski (2003) reports that ground accelerated courses are presented in less time than the conventional number of instructional contact hours. An example would be a student completing a course in 8 weeks rather than 16 weeks. In addition to the shorter time frame for course completion, accelerated learning offers other benefits, such as financial rewards and the capability of satisfying student demand for flexibility (Davies, 2006). Moreover, Austin and Gustafson (2006) mention that students enrolled in accelerated courses are more successful because there is less time between learning and testing, which reduces the likelihood that the student will forget the material.

The increasing number of underprepared students enrolling in community colleges, advancements in technology and other factors deem it necessary to explore different instructional methods and practices needed to ensure the success of developmental students. Although Swenson (2003) mentions that teaching methods and formats do not guarantee results, in an analysis of community college teaching methods, Grubb (1999) indicates that developmental education is one of the most difficult teaching challenges and needs to be rescued from its second class status. In addition, Engstrom

and Tinto (2009) proposed that “to address the success of academically under-prepared students, colleges and universities must stop tinkering at the margins of institutional life, stop the tendency to take an ‘add-on’ approach to institutional innovation, and adopt efforts that restructure the learning environments” (p. 7).

The accelerated course learning format is becoming widespread in both community colleges and universities. Some community colleges have redesigned their method of instruction for developmental courses in a few different ways. Consequently, it is essential to evaluate the effectiveness of the format being utilized in the area of developmental education. There are different variations of accelerated course structures and lengths. Institutional needs and course content are usually deciding factors in the time frame of each course (Baldwin & McInnes, 2002; Daniel, 2000). Several institutions have conducted studies or compiled some type of research involving accelerated learning in developmental courses. Hern and Snell (2011) point out that accelerated learning “reduces the length of developmental sequences and eliminates the ‘exit points’ where students are lost by either not passing a course or not enrolling in the next course” (p. 3).

Although accelerated learning programs have reported success rates, many of the programs have faced a number of challenges. In researching the CCD’s FastStart Program, it was noted that the instructional blocks posed a barrier to part-time students who were not able to meet the courses due to their busy schedules. A Community College Resource Center report by Edgecombe, Jaggars, Baker, and Bailey (2013) revealed that “the program enrolls less than half of students who are referred to multiple levels of developmental education” (p. 8).

While the focus of this study is on acceleration in developmental education, it is important to mention that acceleration has been utilized in other academic courses outside of the developmental arena. Boddy (1985) examined class performance in paired Computer Science classes taught by the same instructor and found that the success rate in accelerated courses was drastically higher than the success rate in the traditional 16-week course. Similar studies were also conducted in the areas of history, economics, and psychology.

### **Research on Acceleration in Developmental Education**

There has been and continues to be serious debates regarding the length of instructional time and the content needed for developmental students to be successful. Gallo and Odu (2009) conducted research to investigate the impact of student achievement at a community college. They concluded that the frequency of lectures has a significant effect on student achievement.

Acceleration in developmental education has been the focus of several studies. In reviewing developmental education research, the community colleges in California determined that the structure of developmental classes needed to be examined more closely. A task force was created in an effort to evaluate developmental English and math. Hern and Snell (2011) confirmed the need to evaluate the developmental sequences. In the article, *Exponential attrition and the promise of acceleration in developmental English and math*, Hern (2010) evaluated statistics from research from two institutions who implemented acceleration models in their respective institutions. The implementation evolved as a plan of action to increase the passage rate in developmental courses. Hern (2011) provided data from a study conducted to review

developmental English at Chabot College in California. The experimental study was a one semester acceleration course that was designed to prepare students for transfer-level English. Students could enroll in the course to avoid enrolling in a course that lasted for two semesters. The assignments were the same for the accelerated class and the traditional class. The data contained statistics on almost 5,000 first time enrollees during eight semesters from the time span of years 2006-2008. The accelerated group was monitored for 2 years and the traditional group was monitored for approximately 2.5 years. The data from Chabot were compared to data from at least two other colleges in the California area. Only 23% of the students enrolled in the two semester section of the course were promoted on to the college English course and successfully completed it. Whereas, 45% of the students enrolled in the accelerated 1-semester course were promoted on to the college-level course and successfully completed (Hern, 2011).

Accelerated learning research has also been conducted at the CCD. The CCD began hosting an accelerated learning community as early as 2005, and throughout the years the college has increased the number of accelerated course options in Math and English/Reading (Edgecombe et al., 2013). The initial implementation of the program was made possible through the Lumina Foundation and other grants. FastStart used the compressed acceleration model to promote student retention and success. Students were provided an opportunity to advance through at least two levels of developmental education courses in one semester.

An evaluation of the FastStart program conducted by the Community College Research Center (CCRC) reported that “students who participated in FastStart were more likely than otherwise similar students to pass the highest developmental math course as

well as to enroll in and pass gatekeeper math courses” (p. 41). The research did not include an evaluation of English/Reading success rates. However, it compared learning outcomes for FastStart participants enrolled in compressed remedial math courses to students in non-FastStart sections of the same courses.

The CCD completed an early evaluation of the FastStart program in 2006. The study monitored eight students (the “intervention group”) in the FastStart program and compared their learning outcomes with two comparison groups. The results indicated that the intervention group had higher retention and course completion rates. Overall, the intervention group had a statistically significant higher success rate than the comparison group. The intervention group had a higher Grade Point Average (GPA) than the comparison group, but it was not statistically significant.

Research of the compressed acceleration method was also conducted at Mountain Empire Community College in Big Stone Gap, Virginia, and at the University of Maryland College Park. The college offered two levels of developmental courses as half semester courses. The courses served the purpose of collaboratively allowing students to learn the course content at a fast pace. Some of the positive results from the studies include increased completion rates, better grades, and increased persistence rates. Bragg and Barnett (2008) observed that FastStart’s compressed course structure allowed faculty to spend less time on review and engage challenging material in greater depth.

A number of Ivy Tech community and technical colleges in Indiana participated in a pilot program that evaluated different acceleration methods during the 2007-2008 academic year. Most notably, the Evansville location offered compressed 8-week courses that were later compared to traditional courses. According to Brown and Ternes (2009),

the statewide initiative included 23 institutions that produced positive outcomes. For example, 71% of the students enrolled in the compressed 8-week developmental math courses successfully completed the courses. However, the success rate of students enrolled in the traditional 16-week semester long course was measured at 52%. When comparing accelerated and traditional developmental reading course results, statistically significant differences included a 58% successful completion rate of students enrolled in the compressed course with only a 25% success rate for the traditional course. English courses were also evaluated, but the percentage differences were not statistically significant. Overall, the persistence rate of accelerated students was higher. It is also important to note that Fort Wayne, another one of the Ivy Tech institutions, reported a withdrawal rate decrease of 50% for participants enrolled in compressed courses.

Austin and Gustafson (2006) conducted research to evaluate the relationship between student learning and course content. According to their research, students in accelerated courses earn higher grades and retain more of the course content. Overall, they found that there is a significant improvement from taking shorter courses. Their investigation spanned from spring 2001 through summer 2004. The data reflect 11,795 University of West Georgia students.

### **Chapter Summary**

Chapter II outlines a review of literature on developmental education. The chapter content includes an overview of developmental education in community colleges and also highlights achievement in developmental education in terms of success and retention. After evaluating extensive studies, Jenkins (2009) reported that students who bypassed the recommended developmental course placement and enrolled in the college-level

course had almost the same success as those who took the developmental course. In addition, results from the *Achieving the Dream* project conducted by Bailey (2010) showed that the rate of completion decreases with each level of remedial coursework required.

Although the accelerated course learning format is not a new concept, it is now being used somewhat extensively by many colleges and universities. As a result, acceleration and accelerated course learning formats are described and evaluated. Statistics were provided to confirm that a large percentage of incoming students were enrolled in developmental courses. Furthermore, research revealed that “developmental courses were offered at 90% of the nation’s community colleges and 70% of our universities” (Boylan et al., 1992).

In reviewing research and studies on acceleration, it was discovered that most were conducted in urban areas. For instance, Hern (2010) researched developmental English and found that only 23% of students in traditional courses successfully completed the college level course compared to 45% of students in the accelerated course. Similarly, developmental math was studied at the CCD and results revealed that students in the accelerated (FastStart) course were more likely to pass the college course (Edgecombe et al., 2013). The review of literature is concluded with a continued review and discussion of data from studies conducted in California and Denver and through other related research efforts.

## CHAPTER III

### METHODS

The purpose of this study was to examine the effect of the accelerated course learning format on student achievement in developmental courses offered at a rural community college. This chapter will describe the method and procedures that will be used to conduct the study. The chapter includes the following sections: a description of the research design, research questions, research site, participants, instruments and materials, data collection, and data analysis.

#### **Research Design**

The researcher used a non-experimental, comparative research design to evaluate the relationship between one independent variable (method of instruction: traditional or accelerated) and two dependent variables (success: grade of A, B, or C and persistence: proceeded to and successfully completed the college level course: English Composition I and College Algebra). Historical enrollment data were collected from three campuses of a rural community college located in Mississippi. The data extracted were from the fall 2010 through the fall 2015 enrollment period. This methodology was chosen to increase the generalizability of the findings for both the institution and the students.

## **Research Questions**

The research questions below were derived from a review of literature on students enrolled in developmental education courses at community colleges.

1. Is there a statistically significant difference between traditional and accelerated course delivery methods on student success (grades) in developmental courses for both English and mathematics?
2. Is there a statistically significant difference between traditional and accelerated course delivery methods on student persistence in college level courses for both English and mathematics?
3. Is student success (grade: A, B, or C) in English Composition I significantly related to the number of developmental courses a student is required to take?
4. Is student success (grade: A, B, or C) in College Algebra significantly related to the number of developmental courses a student is required to take?

## **Research Site**

The research site was a rural community college located in Mississippi whose mission is in part to provide programs, services, and other recreational opportunities to the communities and students that it serves. The college has three campuses with a total average enrollment of 3,253. The student population is diverse in age, ethnicity, economic status, and academic readiness.

Both credit and non-credit courses are offered at the institution. The course delivery methods include: traditional, accelerated (intensive), and online. All three campuses offer both traditional and accelerated developmental education courses.

The site was chosen because it is located in rural Mississippi. In addition, the researcher is employed within the institution and has a genuine interest in student achievement.

### **Participants**

The participants in the study consisted of students enrolled in at least one developmental English or math course offered in an accelerated or traditional format during the fall 2010 through fall 2015 enrollment period. Participants were at least 18 years of age and enrolled in a section of one of the following courses: Beginning English, Intermediate English, Beginning Algebra, or Intermediate Algebra. The students were placed in courses based on their test scores (ACT or Compass).

With the assistance of the college's Institutional Effectiveness Office and computer center staff, student data from both traditional (16-week) and accelerated (8-week) developmental education courses were retrieved, evaluated, and stored in a location to maintain anonymity and confidentiality. Individual student final grades were analyzed in traditional and accelerated developmental education math and English courses (beginning and intermediate English and algebra). Final grades in college level English and math courses (English Composition and College Algebra) were reviewed to help determine persistence.

### **Instrumentation**

The dependent variables in this research study were evaluated and measured using existing data for comparison. The data were extracted from the college's system by the Director of Institutional Effectiveness and the college's computer staff. Students enrolled

in developmental English and math courses between the periods of fall 2010 and fall 2015 were compared for success and persistence.

### **Procedure**

After the researcher obtained permission from the Institutional Review Board at Mississippi State University, the Mississippi Community College Board, and the Institutional Effectiveness Office at the College, the existing data on traditional (16-week) and accelerated (8-week) developmental education courses was retrieved and evaluated. The research did not pose any foreseeable risks for students. All student data were kept strictly confidential. Student names or other identifiable information were not disclosed anywhere in the research.

Institutional developmental English and math data from all three campuses were extracted from the fall 2010 through the fall 2015 enrollment period. The researcher used a non-experimental research design to conduct the study. The relationship between the independent variable: traditional (16-week) and the accelerated (8-week) course and the dependent variables: success (grade A, B, or C) and persistence (proceeded to and successfully completed the college level course) was reviewed to answer the research questions. The data were analyzed to determine if the more levels of developmental courses a student was required to complete, the less likely it was that the student persisted to complete the college level course.

### **Data Analysis**

Descriptive statistics were used to analyze the data. Using descriptive statistics helps to ensure that the data are organized in a meaningful context (Gall, Borg, & Gall,

1996). After the data were organized, the data were analyzed to evaluate the population. Chi Squares were used for the first two questions, and questions three and four involved a correlation of developmental courses (Beginning and Intermediate) correlated with their respective college level courses in English and math.

The Chi Square tests were used to determine how well the experiential distribution of data fit with the distribution that was anticipated with the independent variables. In regards to success, the student had to earn a “C” or higher to be considered successful. Persistence was reflected as a student’s successful completion of the college level course: English Composition I and College Algebra.

### **Chapter Summary**

Chapter III explains the research design that was utilized for the study. Research site information and a description of research participants were also provided in this chapter. A description of the statistical methods was discussed along with procedures for data collection. The chapter concluded with an explanation of the research data analysis.

## CHAPTER IV

### DATA ANALYSIS AND FINDINGS

Chapter IV presents an analysis of the data and the findings for this study. The study assessed the effectiveness of accelerated learning on student achievement in developmental courses offered at a rural community college in Mississippi. The participants in the study consisted of students enrolled in at least one developmental English or math course offered in an accelerated (8-week) or traditional (16-week) format during the fall 2010 through fall 2015 enrollment period.

The study evaluated four research questions which were as follows:

1. Is there a statistically significant difference between traditional and accelerated course delivery methods on student success (grades) in developmental courses for both English and mathematics?
2. Is there a statistically significant difference between traditional and accelerated course delivery methods on student persistence in college level courses for both English and mathematics?
3. Is student success (grade: A, B, or C) in English Composition I significantly related to the number of developmental courses a student is required to take?
4. Is student success (grade: A, B, or C) in College Algebra significantly related to the number of developmental courses a student is required to take?

IBM Statistical Package for the Social Sciences (SPSS) version 24.0 was used to organize and analyze the historical enrollment data. Students enrolled in developmental courses (Beginning Algebra, Intermediate Algebra, Beginning English, and Intermediate English) were the focus of Question 1 and 2, and the students enrolled in college level courses (College Algebra and English Composition I) were used to research Questions 3 and 4. Table 1 highlights the number of students tracked in both developmental and college level courses.

Table 1

*Number of Students Tracked in Developmental and College Level Courses*

| <b>Developmental Courses</b> | <b><i>N</i></b> | <b>College Level Courses</b> | <b><i>N</i></b> |
|------------------------------|-----------------|------------------------------|-----------------|
| Beginning Algebra            | 1305            | College Algebra              | 819             |
| Intermediate Algebra         | 2609            | English Composition I        | 1599            |
| Beginning English            | 1202            |                              |                 |
| Intermediate English         | 1888            |                              |                 |

Descriptive statistics were used to analyze the questions. Pearson’s Chi-Square was used to determine the differences between the two proportions. Students who dropped, repeated, withdrew, or were cut out of courses were removed to create a clean, pure data set. Students who failed the developmental courses were removed from the data set; whereas the students who failed the college-level courses remained in the data set to track persistence.

## Analysis of Research Questions

### Examination of Research Question One

Is there a statistically significant difference between traditional and accelerated course delivery methods on student success (grades) in developmental courses for both English and mathematics?

Success in this study was measured by the student's ability to complete coursework, assignments, and tests and earn a minimum final grade of C or better in developmental courses. The tables below capture success rates in 8-week and 16-week developmental English and math courses; whereas, the figures outlined below specifically highlight pass rates in developmental English and math courses respectively. Results were consistent for each developmental course, math and English. Students enrolled in 8-week courses consistently outperformed students enrolled in sixteen-week courses.

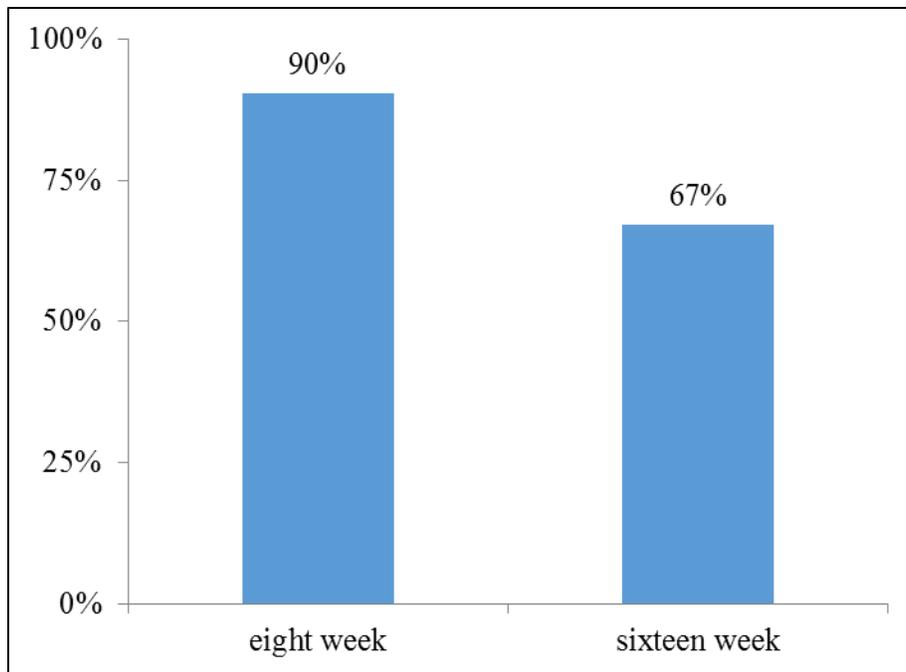
**Beginning English.** Table 2 contains the Beginning English success rates for 1,305 students. The number of students enrolled in 8-week courses was 524. Out of the 524 students, 473 passed and 51 failed the 8-week course. In evaluating the 16-week beginning English course, 781 students were enrolled with 523 passing and 258 students failing.

Table 2

*Beginning English Success Rates by Course Delivery Length*

|        | Eight Week |            | Sixteen Week |            |
|--------|------------|------------|--------------|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>     | <i>PCT</i> |
| Pass   | 473        | 90.3%      | 523          | 67.0%      |
| Fail   | 51         | 9.7%       | 258          | 33.0%      |
| Totals | 524        | 100%       | 781          | 100%       |

The Chi-Square test for independence was performed to examine the relationship between student success and course delivery length for students taking beginning English. The relationship between these variables was statistically significant (Pearson  $\chi^2(1, N = 1,305) = 94.22, p < .001$ ). The results, as demonstrated in Figure 1, indicate that students enrolled in the accelerated 8-week course had a better likelihood of passing Beginning English.



*Figure 1.* Pass rates of Beginning English students by course delivery length.

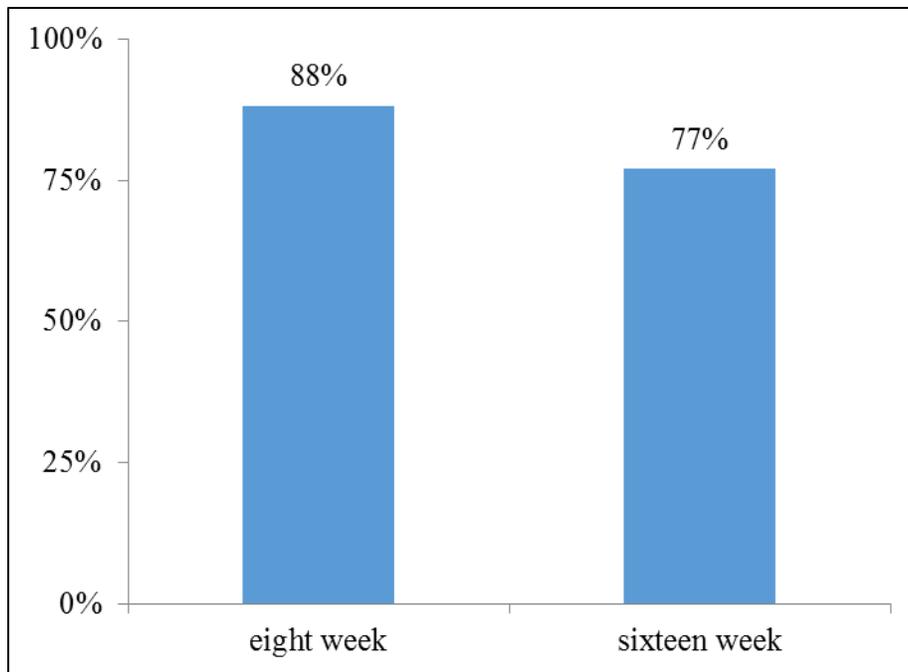
**Intermediate English.** Table 3 highlights the Intermediate English success rates for 2,609 students. The number of students enrolled in the 8-week course was 1,026. Out of the 1,026 students, 905 passed and 121 failed the 8-week course. A review of the 16-week Intermediate English course revealed that 1,583 students were enrolled with 1,221 passing and 362 students failing.

Table 3

*Intermediate English Success Rates by Course Delivery Length*

|        | Eight Week |            | Sixteen Week |            |
|--------|------------|------------|--------------|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>     | <i>PCT</i> |
| Pass   | 905        | 88.2%      | 1221         | 77.1%      |
| Fail   | 121        | 11.8%      | 362          | 22.9%      |
| Totals | 1026       | 100%       | 1583         | 100%       |

The Chi-Square test for independence was performed to examine the relationship between student success and course delivery length for students taking intermediate English. The relationship between these variables was significant (Pearson  $\chi^2(1, N = 2,609) = 50.61, p < .001$ ). As shown in Figure 2, Intermediate English students enrolled in the 8-week course had significantly higher pass rates than Intermediate English students enrolled in a 16-week course.



*Figure 2.* Pass rates of Intermediate English students by course delivery length.

**Beginning Algebra.** Table 4 captures Beginning Algebra success rates for 1,202 students. The number of students enrolled in 8-week courses was 200. Out of the 200 students, 171 passed and 29 failed the 8-week courses. In contrast, the 16-week Beginning Algebra course revealed that 1,002 students were enrolled with 673 passing and 329 students failing.

Table 4

*Beginning Algebra Success Rates by Course Delivery Length*

|        | Eight Week |            | Sixteen Week |            |
|--------|------------|------------|--------------|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>     | <i>PCT</i> |
| Pass   | 171        | 85.5%      | 673          | 67.2%      |
| Fail   | 29         | 14.5%      | 329          | 32.8%      |
| Totals | 200        | 100%       | 1,002        | 100%       |

The Chi-Square test for independence was performed to examine the relationship between student success and course delivery length for students taking Beginning Algebra. The relationship between these variables was statistically significant (Pearson  $\chi^2(1, N = 1,202) = 26.80, p < .001$ ). As indicated in Figure 3, the pass rate in the 8-week courses was higher than the pass rate in the 16-week courses.

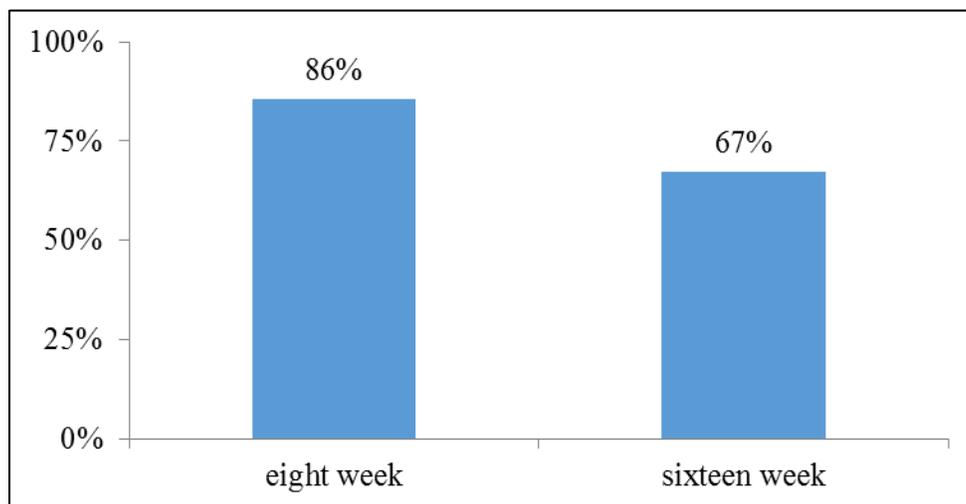


Figure 3. Pass rates of Beginning Algebra students by course delivery length.

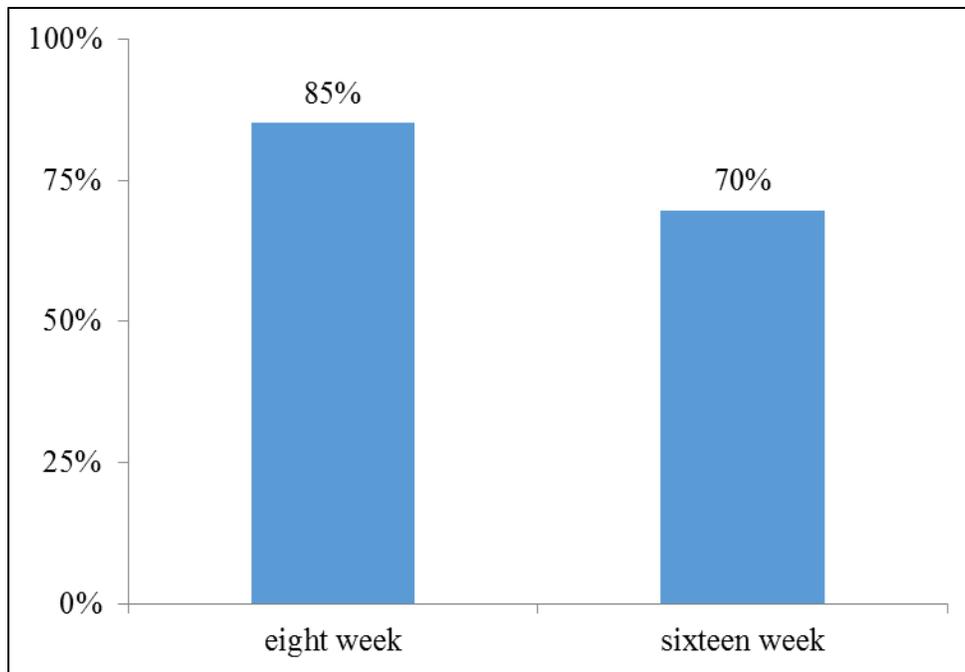
**Intermediate Algebra.** Table 5 displays Intermediate Algebra success rates for 1,888 students. The number of students enrolled in 8-week courses was 589. Out of the 589 students, 502 passed and 87 failed the 8-week courses. In evaluating the 16-week Beginning Algebra course, 1,299 students were enrolled with 906 passing and 393 students failing.

Table 5

*Intermediate Algebra Success Rates by Course Delivery Length*

|        | Eight Week |            | Sixteen Week |            |
|--------|------------|------------|--------------|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>     | <i>PCT</i> |
| Pass   | 502        | 85.2%      | 906          | 69.7%      |
| Fail   | 87         | 14.8%      | 393          | 30.3%      |
| Totals | 589        | 100%       | 1,299        | 100%       |

The chi-square test for independence was performed to examine the relationship between student success and course delivery length for students taking Intermediate Algebra. The relationship between these variables was significant,  $\chi^2(1, N = 1,888) = 51.24, p < .001$ . Intermediate algebra students enrolled in 8-week classes had significantly higher pass rates than intermediate algebra students enrolled in 16-week classes, as demonstrated in Figure 4.



*Figure 4.* Pass rates of Intermediate Algebra students by course delivery length.

### **Examination of Research Question Two**

Is there a statistically significant difference between traditional and accelerated course delivery methods on student persistence in college level courses for both English and mathematics?

In relation to this study, persistence is defined as the ability of a student to proceed to and successfully complete the college level course. In researching Question 2, College Algebra and English Composition I success rates of developmental students were studied to determine if the student persisted in the correct manner. Specifically, they were tracked to see if progression occurred in the manner in which the institution intended them to progress.

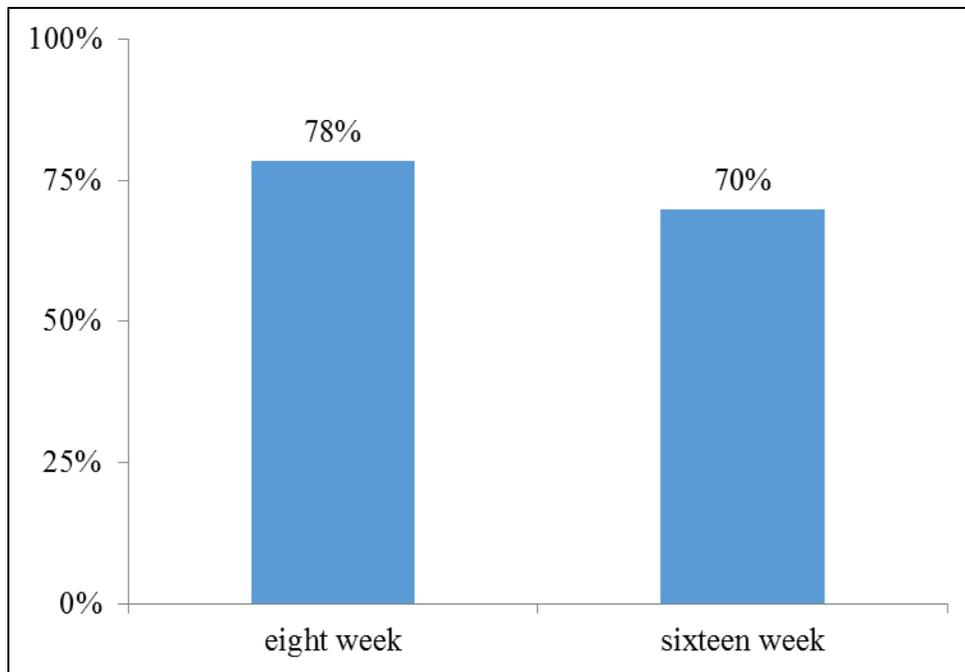
**English Composition I.** English Composition I success rates for the 1,599 students are outlined below in Table 6. A total of 415 students were enrolled in the 8-week course. Out of the 415 students, 325 passed and 90 failed. In contrast, the total number of students enrolled in the 16-week course was 1,184 with 826 passing and 358 failing.

Table 6

*English Composition I Success Rates of Developmental Students by Delivery Length*

|        | Eight Week |            | Sixteen Week |            |
|--------|------------|------------|--------------|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>     | <i>PCT</i> |
| Pass   | 325        | 78.3%      | 826          | 69.8%      |
| Fail   | 90         | 21.7%      | 358          | 30.2%      |
| Totals | 415        | 100%       | 1,184        | 100%       |

The Chi-Square test for independence was performed to examine the relationship between student success and course delivery length for students persisting through developmental courses and taking English Composition I. The relationship between these variables was statistically significant (Pearson  $\chi^2(1, N = 1,599) = 11.138, p < .01$ ). Developmental students persisting into English Composition I enrolled in 8-week courses had significantly higher pass rates than those in the 16-week class format, as demonstrated in Figure 5.



*Figure 5.* Pass rates of English Composition I students by course delivery length.

**College Algebra.** Table 7 displays College Algebra success rates for 819 students. The number of students enrolled in eight week courses was 243. Out of the 243 students, 193 passed and 50 failed the 8-week courses. In evaluating the 16-week College Algebra course, 576 students were enrolled with 399 passing and 177 students failing.

Table 7

*College Algebra Success Rates of Developmental Students by Course Delivery Length*

|        | Eight Week |       | Sixteen Week |       |
|--------|------------|-------|--------------|-------|
|        | N          | PCT   | N            | PCT   |
| Pass   | 193        | 79.4% | 399          | 69.3% |
| Fail   | 50         | 20.6% | 177          | 30.7% |
| Totals | 243        | 100%  | 576          | 100%  |

The chi-square test for independence was performed to examine the relationship between student success and course delivery length for students persisting through developmental courses and taking college algebra. The relationship between these variables was statistically significant (Pearson  $\chi^2(1, N = 819) = 8.793, p < .01$ ). Developmental students persisting into college algebra enrolled in 8-week classes had significantly higher pass rates than those in the 16-week class format, as demonstrated in Figure 6.

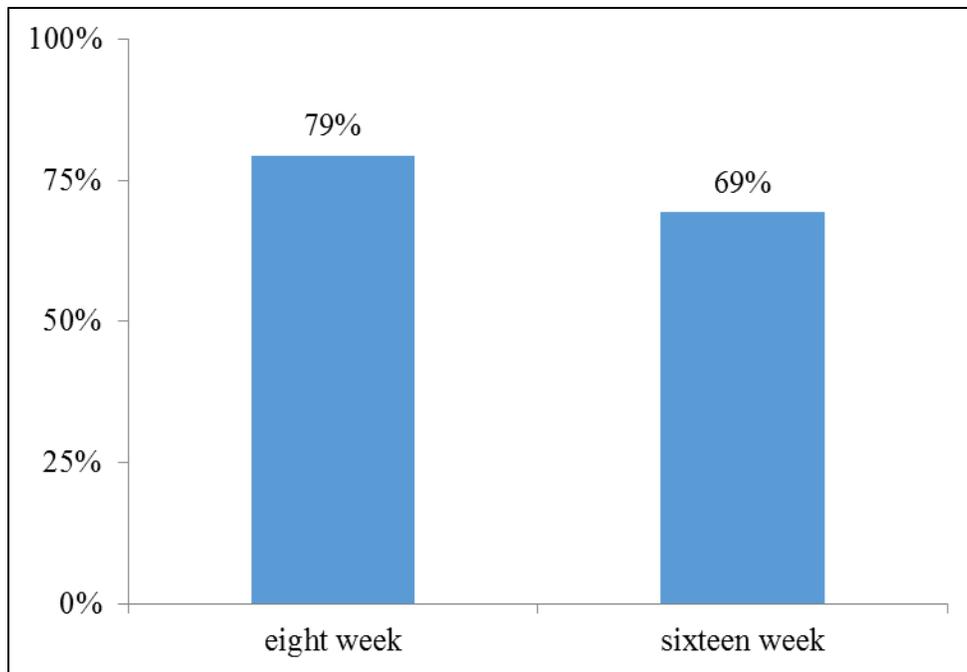


Figure 6. Pass rates of College Algebra students by course delivery length.

Research questions Three and Four of this study focused on developmental students who actually completed the college level English and math courses. An analysis was conducted on the developmental students who passed English Composition I and College Algebra. IBM SPSS version 24.0 was used to filter the data set to remove students who did not pass the developmental courses. The students who remained were analyzed to determine the number of developmental courses taken prior to completing the college level course. Students enrolled in the beginning level course had to pass two courses (beginning and intermediate) before enrolling in the college level course. Whereas, students enrolled in the intermediate course only had to take that one course before enrolling in the college level course.

### Examination of Research Question Three

Is student success (grade: A, B, or C) in English Composition I significantly related to the number of developmental courses a student is required to take?

**English Composition I.** English Composition I findings are shown below in Table 8. The table outlines the success rates of English Composition I students in relation to the number of developmental courses taken prior to completing the college level course. A total of 1,599 English Composition I students were analyzed. Out of the 1,599 students, 508 students started in Beginning Algebra with 336 passing and 172 failing. The total number of students who started in Intermediate Algebra was 1,091 in which 815 passed and 276 failed.

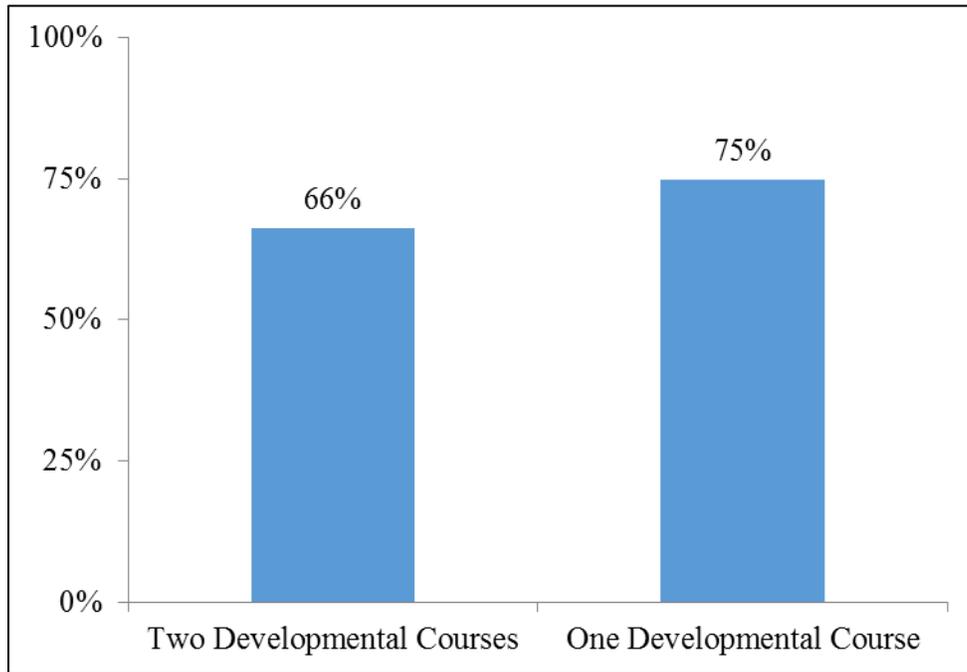
Table 8

*English Composition I Success Rates of Developmental Students by Numbers of Courses*

|        | Beginning English<br>(Two Developmental Courses) |            | Intermediate English<br>(One Developmental Course) |            |
|--------|--|------------|--|------------|
|        | <i>N</i>   | <i>PCT</i> | <i>N</i>   | <i>PCT</i> |
| Pass   | 336  | 66.1%      | 815  | 74.7%      |
| Fail   | 172  | 33.9%      | 276  | 25.3%      |
| Totals | 508  | 100%       | 1091   | 100%       |

The Chi-Square test for independence was performed to examine the relationship between student success and the number of developmental education courses for students persisting through developmental courses and taking English Composition I. The

relationship between these variables was significant,  $\chi^2(1, N = 1,599) = 12.594, p < .01$ . As illustrated in Figure 7, the pass rate of students who took two developmental courses was lower than those who took only one developmental course.



*Figure 7.* Pass rates of English Composition I students by number of developmental courses.

#### **Examination of Research Question Four**

Is student success (grade: A, B, or C) in College Algebra significantly related to the number of developmental courses a student is required to take?

**College Algebra.** College Algebra research results are shown below in Table 9.

The table outlines the success rates of College Algebra students relative to the number of developmental courses taken prior to completing the college level course. A total of 819

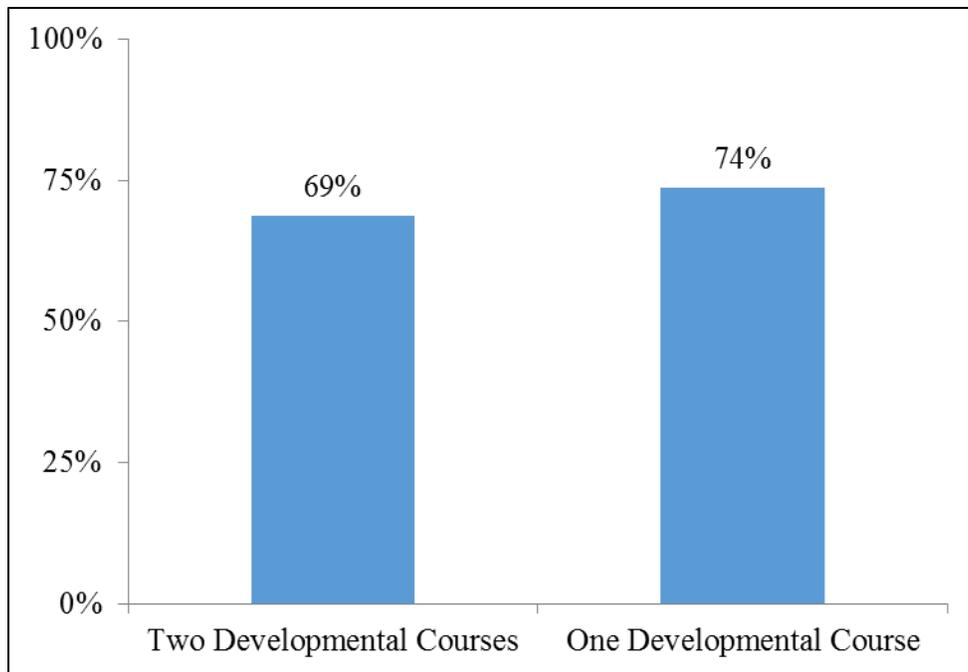
English Composition I students were analyzed. Out of the 819 students, 230 students started in Beginning Algebra with 158 passing and 72 failing. The total number of students who started in Intermediate Algebra was 589 in which 434 passed and 155 failed.

Table 9

*College Algebra Success Rates of Developmental Students by Numbers of Courses*

|        | Beginning Algebra<br>Two Developmental Courses |       | Intermediate Algebra<br>One Developmental Course |       |
|--------|--|-------|--|-------|
|        | N  | PCT   | N  | PCT   |
| Pass   | 158  | 68.7% | 434  | 73.7% |
| Fail   | 72   | 31.3% | 155  | 26.3% |
| Totals | 230  | 100%  | 589  | 100%  |

The chi-square test for independence was performed to examine the relationship between student success and number of developmental education courses for students persisting through developmental courses and taking college algebra. The relationship between these variables was not significant (Pearson  $\chi^2 (1, N = 819) = 2.055, p = .152$ ). Students were just as likely to pass college algebra regardless of the number of developmental math courses they had taken. A visual of the pass rates is shown in Figure 8.



*Figure 8.* Pass rates of College Algebra students by number of developmental courses.

CHAPTER V  
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

**Introduction**

Chapter V is comprised of an overview of the study along with conclusions and recommendations. A summary of the research is provided and limitations will also be identified in this chapter.

**Summary of the Study**

Chen (2016) reported that nationwide each year, a large percentage of first time students who enroll in college are not prepared for college level work. According to the research, during the 2003-2004 timespan, 48% of students at 2-year public community colleges took two or more remedial courses within six years. In addition, data reported in a CCRC report by Attewell, Lavin, Domina, & Levey (2006) indicated that only 28% of developmental students persisted to earn a degree or certificate in 8.5 years.

Since many of the students do not possess the skills needed to perform academically in reading, math, and writing, they are considered developmental and in some instances, are referred to multiple levels of developmental courses. Hern (2010) discussed Myra Snell's "multiplication principle" which states that "multiple levels of developmental courses are 'harmful' to students because they dramatically decrease a students' likelihood of completing the transfer level course" (p. 2).

Community colleges nationwide have been asked to increase their graduation rates. As a result, many of the colleges have worked to alter the way that developmental courses are offered to students needing remediation. Through the efforts of the Achieving the Dream initiative and other course redesign efforts, institutions have transformed the way that developmental courses are offered in community colleges. Acceleration was introduced as a way to help with retention and to help developmental students persist to successfully complete the college level course. Students enrolled in compressed accelerated courses had the opportunity to complete two developmental courses in one semester instead of taking one course the entire semester.

Research on the effectiveness of acceleration conducted in several urban states concluded that a reduction in the number of courses and the length of time contributes to more student success (Hern & Dewitt, 2010). Since most of the existing research was conducted in urban areas, this study examined the effect of the accelerated course learning format on student achievement in developmental courses from a rural community college perspective. Historical enrollment data on students enrolled in at least one developmental English or math course offered in an accelerated (8-week) or traditional (16-week) format during the fall 2010 through fall 2015 enrollment period were analyzed using IBM SPSS version 24.0 to determine the effectiveness of accelerated learning on student achievement in developmental courses offered at a rural community college in Mississippi.

### **Conclusions**

Four research questions were examined to highlight the findings previously presented in Chapter IV. The questions are outlined below.

### **Research Question 1**

Is there a statistically significant difference between traditional and accelerated course delivery methods on student success (grades) in developmental courses for both English and mathematics?

In both English and math, students enrolled in 8-week courses consistently outperformed students enrolled in 16-week courses. The relationship between these variables was statistically significant. The results indicate that students enrolled in the accelerated 8-week course had a better likelihood of passing Beginning English, Intermediate English, Beginning Algebra, and Intermediate Algebra.

Overall, the results tend to be consistent with other research conducted to evaluate success in accelerated courses. Sheldon and Durdella (2010) performed an evaluation of historical enrollment records to examine the relationship between course length and student outcomes for developmental English, math, and reading courses at a suburban community college in California. The results revealed that students taking accelerated English courses had a success rate of 76% compared to a 57% success rate for the students enrolled in traditional English courses. The success rates for math were 58% for accelerated math courses, compared to 51% for traditional math courses.

### **Research Question 2**

Is there a statistically significant difference between traditional and accelerated course delivery methods on student persistence in college level courses for both English and mathematics?

The relationship between student success and course delivery length for students persisting through developmental courses and taking English Composition I and College

Algebra was examined, and the variables were statistically significant. Developmental students persisting into English Composition I and College Algebra who were enrolled in 8-week courses had significantly higher pass rates than those who were enrolled in the 16-week class format.

In the article, “*What We Know about Developmental Education Outcomes*”, Jaggars and Stacey (2014, p. 6) mentions that “accelerated developmental education helps with the completion of college level English and math courses and provides a boost to the student’s overall college-level credit furthering their progress toward a degree.” In addition, their research suggests that students who enroll in accelerated developmental courses perform almost as well in the college level course as their non-accelerated peers.

### **Research Question 3**

Is student success (grade: A, B, or C) in English Composition I significantly related to the number of developmental courses a student is required to take?

The relationship between student success and the number of developmental education courses for students persisting through developmental courses and taking English Composition I was evaluated. The pass rate of students who took two developmental courses was lower than those who took only one developmental course. These findings are slightly different from results found in an evaluation of the progression of students on a similar path at Chabot College in California.

Hern (2011) evaluated the accelerated developmental English option that enables students to progress to college-level English after a single semester of developmental English rather than taking two semesters of developmental English at Chabot College. The results indicate that Chabot’s accelerated students were more likely to complete

gatekeeper English than students who completed the traditional sequence. Accelerated students who enrolled in the gatekeeper course passed it at approximately the same rate as their peers who completed the traditional developmental sequence.

#### **Research Question 4**

Is student success (grade: A, B, or C) in College Algebra significantly related to the number of developmental courses a student is required to take?

The success rates of College Algebra students relative to the number of developmental courses taken prior to completing the college level course were examined to determine the relationship between student success and number of developmental education courses. The relationship between these variables was not significant. Students were just as likely to pass college algebra regardless of the number of developmental math courses they had taken.

The CCD's FastStart program evaluated math. The program's math sequence consisted of three courses. FastStart compressed the courses into two pairs to allow for acceleration. Students in the FastStart program were more likely to complete the gatekeeper math. There was not a statistically significant difference in success rates between FastStart and traditional students. However, FastStart math students, appeared to complete the developmental education courses with a level of preparedness similar to those who took the traditional sequence (Edgecombe et al., 2013)

#### **Limitations of the Study**

Limitations to this study are outlined below and should be considered.

- The data for the study were collected for only one community college.

- The historical data utilized included only the fall 2010 through fall 2015 timeframe.
- The study only examined English and math.
- Drops, withdrawals, and repeats were removed from the study.

### **Recommendations for Policy and Practice**

College faculty and administrators can utilize this study to aid in course planning and structuring. The findings should also be considered as an avenue to improve student success and retention rates, which should also improve graduation rates. Policy and practice recommendations are as follows:

- Since students enrolled in 8-week courses consistently outperformed students in 16 week courses, course schedules should be reviewed to see if more 8-week courses can be offered to developmental students.
- Counselors and administrators should track developmental students to ensure that they are persisting in the desired manner.

### **Recommendations for Future Research**

Current research on acceleration revealed that most of the studies were conducted in urban areas. This research will help to fill in the gaps of existing literature by providing data from a rural community college perspective. Recommendations for future research on acceleration in developmental education should consider the following.

- Review the withdrawals and discuss demographics to determine if students withdrew because the course was too fast.
- Evaluate students who repeated courses and changed formats.

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APPENDIX A  
IRB APPROVAL

From: **ncobb@orc.msstate.edu**  
To: azf3@msstate.edu  
cc: ncobb@orc.msstate.edu,  
ads124@colled.msstate.edu  
Date: Thu, Apr 21, 2016 at 10:12 AM  
Subject: Study 16-121: Effectiveness of Accelerated Learning on Student Achievement in Developmental Courses  
mailed- orc.msstate.edu  
by:

Protocol Title: Effectiveness of Accelerated Learning on Student Achievement in Developmental Courses  
Protocol Number: 16-121  
Principal Investigator: Ms. Anika Floyd  
Date of Determination: 4/21/2016  
Qualifying Exempt Category: 45 CFR 46.101(b)(4)

Dear Ms. Floyd:

The Human Research Protection Program has determined the above referenced project exempt from IRB review.

Please note the following:

- Retain a copy of this correspondence for your records.
- An approval stamp is required on all informed consents. You must use the stamped consent form for obtaining consent from participants.
- Only the MSU staff and students named on the application are approved as MSU investigators and/or key personnel for this study.
- The approved study will expire on 12/31/2016, which was the completion date indicated on your application. If additional time is needed, submit a continuation ! request. (SOP 01-07 Continuing Review of Approved Applications)
- Any modifications to the project must be reviewed and approved by the HRPP prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project.
- Per university requirement, all research-related records (e.g. application materials, letters of support, signed consent forms, etc.) must be retained and available for audit for a period of at least 3 years after the research has ended.

- It is the responsibility of the investigator to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under the Mississippi State University's OHRP Federalwide Assurance #FWA00000203. All forms and procedures can be found on the HRPP website: [www.orc.msstate.edu](http://www.orc.msstate.edu).

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at [ncobb@orc.msstate.edu](mailto:ncobb@orc.msstate.edu) or call [662-325-5220](tel:662-325-5220).

Finally, we would greatly appreciate your feedback on the HRPP approval process. Please take a few minutes to complete our survey at <https://www.surveymonkey.com/s/PPM2FBP>.

Sincerely,

Nicole Cobb  
Compliance Administrator

cc: Arthur Stumpf, Advisor