5-2015

Impact of a Freshman Academy Versus a Traditional High School on Academic Achievement in Mathematics and Literacy

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IMPACT OF A FRESHMAN ACADEMY VERSUS A TRADITIONAL HIGH SCHOOL ON ACADEMIC ACHIEVEMENT IN MATHEMATICS AND LITERACY

by

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Dissertation

Submitted to the Faculty of

Harding University

Cannon-Clary College of Education

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Educational Leadership P-20

May 2015

IMPACT OF A FRESHMAN ACADEMY MODEL VERSUS A TRADITIONAL HIGH SCHOOL MODEL ON ACADEMIC ACHIEVEMENT IN MATH AND LITERACY

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Dissertation

Dissertation Advisor — Date 2/20/15

Dissertation Reader — Date 2/20/15

Dissertation Reader — Date 2/20/2015

Dean of the Cannon-Clary College of Education — Date 2/20/2015

Assistant Provost for Graduate Programs — Date 2/20/2015

ACKNOWLEDGMENTS

I am grateful to God who continues to meet me in lonely places and exalts me as He sees fit. I thank my amazing mother and father for having the wisdom not to praise me for ordinary accomplishments and making sure I never got a trophy unless I earned it. I am also grateful to my friends and colleagues in education who encouraged me to finish this work. I would like to express my gratitude for the guidance and support provided me by my Dissertation Advisor, Dr. Lynette Busceme and my Dissertation Readers, Dr. Steve Warren and Dr. Illene Huffard. Finally, I am grateful to the leadership at Harding University who had the vision of instituting a doctoral program for educators who desire to join faith with learning and leadership.

ABSTRACT

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May 2015

Title: Impact of a Freshman Academy Versus a Traditional High School on Academic Achievement in Mathematics and Literacy (Under the direction of Dr. Lynette Busceme)

The purpose of this dissertation was to explore the impact of a freshman academy versus a traditional high school on the academic achievement in mathematics and literacy. The dissertation first outlined a brief history of school reform in the United States from colonial days to present. It then presented an extensive review of the literature related to the pivotal nature of the ninth-grade year and the use of freshman academies to improve student success during the ninth-grade year. The dissertation then outlined a study between two south-central Arkansas schools: a traditional high school with 151 participants, and a freshman academy with 275 participants. The study examined participant mathematics and literacy achievement by gender and socioeconomic status. Both schools were majority-White schools; therefore, ethnicity was not a variable considered in this study. There was no significant difference by gender or by socioeconomic status in the mathematics or literacy achievement between participants in a freshman academy versus those in a traditional high school. The dissertation suggested possible reasons for the results as well as considerations for future research.

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CHAPTER I

INTRODUCTION

Successfully transitioning students from middle school to high school is a challenging and complex endeavor critical for securing a solid foundation for academic success throughout high school. Research statistics recorded by the Southern Regional Education Board (SREB) revealed nationally the failure rate in ninth-grade is higher than the failure rate in any other grade (Bottoms, 2008). In addition, SREB reported students who were unprepared for high school and failed ninth-grade were far less likely to graduate. SREB also claimed ninth-grade students are failing to connect high school studies to future goals, and schools are failing to provide students with meaningful experiences to promote success.

Compounding the low levels of student engagement and high ninth-grade failure rates were the extensive economic challenges created by high school dropouts. According to SREB, each high school dropout cost a state between $3000 and $5000 per year (Bottoms, 2008) and high school dropouts earned about one-third less than high school graduates. Finally, because the graduation rate of low-income students was 7% below the average graduation rate, the economic disadvantage experienced by high school dropouts also contributed to the cyclical challenges experienced by those in poverty.

Because the research illustrated the ninth-grade year as such a pivotal year in terms of adjustment and achievement, educational practitioners have created a number of

initiatives designed to promote success of ninth-graders. Donegan (2008) described what she called *the linchpin year* and expressed the importance of treating the transition from middle school to high school as an ongoing process. Donegan also expressed one of the biggest challenges in creating a successful transitioning process was to resist the urge to have school as usual.

Bottoms (2008) cited freshman academies as a strategy for addressing the challenges faced by ninth-graders across the nation. Though there are a variety of different freshman academy models, SREB identified the following common attributes of successful academy models: (a) a heterogeneous student mix, (b) an instructional facilitator, (c) a common planning time for academy teachers, (d) a student-to-teacher ratio comparable to all other grade levels, and (e) a placement of best teachers in ninth-grade courses.

Hertzog (2006) proposed there must be no permanent template adopted for implementing a freshman academy. He contended that each class of students was unique and must be treated accordingly in the transition process. With the dynamic nature of education and the increasing challenges facing educational practitioners in today's classrooms, uniquely designed academy models are being implemented across the nation in order to increase the academic achievement of ninth-graders during such a crucial time in their academic career.

Statement of the Problem

The purposes of this study were four-fold. First, this study sought to determine the effects by gender of a freshman academy versus a traditional high school on the literacy achievement as measured on the Arkansas Benchmark Exam for ninth-grade students in

two southeast Arkansas high schools. Second, this study sought to determine the effects by gender of a freshman academy versus a traditional high school on the mathematics achievement as measured on the Arkansas Algebra I End of Course Exam for ninth-grade students in two southeast Arkansas high schools. Third, this study sought to determine the effects by socioeconomic status of a freshman academy versus a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam for ninth-grade students in two southeast Arkansas high schools. Fourth, this study sought to determine the effects by socioeconomic status of a freshman academy model versus a traditional model on mathematics achievement as measured on the Arkansas Algebra I End of Course Exam for ninth-grade students in two southeast Arkansas high schools.

Background

The concept of creating a new freshman experience for students transitioning from eighth to ninth-grade was introduced in the mid-1990s (Macala, 2002). In 2004, 154 ninth-grade only schools were operating in the United States (National High School Center, 2007). According to the National High School Center (2007), that number is only reflective of ninth-grade only schools and not indicative of the total number of Freshman Academies in the United States. The freshman academy structure was designed to help educators improve ninth-grade failure rates, absenteeism, and discipline issues (Macala, 2002). Published research concerning the effectiveness of freshman academies in improving student academic performance described overwhelmingly positive results in the redesigned ninth-grades. Opponents of the restructuring were scarce and limited mainly to criticisms of freshman academy models that were not fully implemented.

Importance of the Transition Year

Research suggested that the ninth-grade year is a pivotal year for students in a number of ways. In 2013, 73.9% of students who entered the ninth-grade in Arkansas actually graduated from high school (National Center for Higher Education Management Systems Information Center, 2013). Researchers at Johns Hopkins University found up to 40% of ninth-grade students in cities with the highest dropout rates repeated ninth-grade; however, only 10%-15% of those repeaters graduated (McCallumore & Sparapani, 2010). In addition, McCallumore and Sparapani (2010) noted transferring to a new school also created a transition period marked by declining academic performance, increased absences, and increased behavior disturbances. They cited one major academic transition issue as differences in how credit is earned in middle school and high school. In addition, their research noted students entering the ninth-grade also faced challenging social, emotional, and developmental situations that were often complicated by increased course rigor and graduation requirements. Ninth-graders also had problems identifying the relevance of courses.

Many ninth-graders were held back during the transitional year creating what is known as the ninth-grade bulge (National High School Center, 2007). Schools with transitional programs such as freshman academies had a ninth-grade retention rate 16% lower than schools with no program in place (National High School Center, 2007). Discipline incidences among ninth-graders were also a problem during the transitional year. Chmelynski (2004) suggested implementation of freshman academies reduced the number of discipline incidents among ninth-graders by as much as 55% in some schools.

Common Attributes of Freshman Academies

According to the SREB, a freshman academy should organize students into heterogeneous classes (Bottoms, 2008). The key was to avoid creating an academic environment that consisted of only at-risk students. Heterogeneous classes also helped create a school culture that helped ninth-graders adjust to the social changes inherent in transitioning to a high school campus.

SREB also suggested that successful freshman academies appoint an instructional facilitator to help teams of teachers with instructional planning, curriculum design, and uniform assessment (Bottoms, 2008). Teaming teachers is a strategy borrowed from the middle school model of instruction. In addition, teachers in the academy should have a common planning period for building lessons and planning how to address the unique needs of students. The SREB also identified that successful freshman academies all encourage and assign the district's best teachers to teach ninth-grade.

Effective freshman academies create a supportive educational culture by helping students develop a mentor relationship with academic advisors who offer guidance with the academic choices as well as social and emotional challenges that freshmen face during the transition from middle school to high school. Holland and Mazzoli (2001) emphasized the importance of creating a culture of learning that was about not only academics but also about relationships.

Criticisms of the Academy Model and Transitioning Efforts

Though there was no direct opposition to the proposed tenants of the academy model, Donegan (2008) cautioned that efforts made by educational practitioners to redesign the ninth-grade experience should not be isolated to a single summer program or

campus orientation. Rather, a successful ninth-grade transition should be an ongoing process including a fundamental reshaping of the school culture. Donegan highlighted the challenges of breaking through the mindset of school as usual in order to implement the necessary innovative designs in course scheduling and necessary changes in staffing.

One challenge to fully and effectively implement a pure freshman academy model is the allocation of resources to ensure that the academy is fully staffed to allow a full isolation of ninth-graders from upperclassmen (Donegan, 2008). Many academy models implemented in ninth-grade take on characteristics of a hybrid model. In some designs, academy teachers are not permitted to work solely within the ninth-grade while other designs may not completely isolate ninth-grade students from upper grades. Academy models with greater resources function more perfectly as a school within a school. The best way to describe the implementation of an academy model is to examine its attributes and place it on a continuum.

Hypotheses

Initial review of the literature suggested that the freshman academy model of instruction was an effective instructional design for increasing the academic performance of ninth-graders in a variety of school settings. Therefore, the following null hypotheses were generated.

1. No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam.

2. No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End of Course Exam.
3. No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam.
4. No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End of Course Exam.

Description of Terms

Academic achievement. For the purposes of this study, academic achievement is defined as the performance level on the Arkansas End of Course Algebra I Exam and the Arkansas Benchmark Exam.

Arkansas benchmark exam. For purposes of this study, the Arkansas Benchmark Exam is an Arkansas standardized test given to ninth-graders and designed to measure student mastery of literacy skills as well as other content mastery (Arkansas Department of Education, 2009).

End-of-Course algebra I exam. For the purposes of this study, the End of Course Algebra I Exam is an Arkansas standardized test designed to measure student

mastery of the Arkansas Curriculum Frameworks for Algebra I (Arkansas Department of Education, 2009).

Freshman academy. Holland and Mazzoli (2001) defined freshman academies as small learning groups designed to support ninth-grade students during their first year of high school by providing more interaction with teachers, decreased interactions with upperclassmen, and increased academic support.

Traditional high school. The traditional high school is defined as an instructional day in which ninth-grade students during their first year of high school participate in 45- to 50-minute class periods with little or no isolation from upperclassmen.

Significance

The way in which educational practitioners respond to the unique needs of ninth-graders during the transition to high school is a critical application of this research. Educators' awareness of the challenges facing adolescents as they begin the ninth-grade year help them to more attentively and effectively address excessive failure rates, declining student engagement, and the effects of dropping out of high school. This research evaluated the impact of two models on academic achievement of students in a specific demographic characteristic of schools in south-central Arkansas.

In August 2008, the Arkansas Task Force on Higher Education, Remediation, Retention, and Graduation Rates published the *Access to Success* report which suggested a direct correlation between economic prosperity and educational attainment (Arkansas Task Force on Higher Education, Remediation, Retention, and Graduation Rates, 2008). In addition, the United States Census Bureau reported four of the five counties with lowest per capita income in Arkansas are in east and southeast Arkansas (United States

Census Bureau, 2012). South-central Arkansas is currently experiencing a decline in economic productivity and development as well as a decline in population. Because economic prosperity is directly linked to an educated workforce (Arkansas Task Force on Higher Education, Remediation, Retention, and Graduation Rates, 2008) the results of this study are relevant to educational leaders, policy makers, and other stakeholders within the communities of southeast Arkansas as they seek to increase graduation rates and support K-12 schools' efforts to produce a career and college ready workforce.

Research Gaps

This study used existing research based best practices and applied them to demographics specific to southeast Arkansas. Because the implementation of a freshman academy is measured more along a continuum rather than a discrete model for implementation, each study in which a freshman academy model is implemented offers unique insight into the effectiveness of the redesign.

Further, this study built on existing literature on freshman academies by taking into direct consideration the free and reduced lunch population in two southeast Arkansas schools. The broader scope of existing research focused mainly on effects of freshman academies by gender and by race. The amount of literature available on academy impact in relation to socio-economic status was comparatively limited.

This quantitative study also acknowledged in the review of literature the qualitative nature of an effective mentoring program. Although not the direct focus of this study, the implementation of an effective mentoring program was always a characteristic of the freshman academy addressed in the broader scope of existing research. The

researcher attempted to acknowledge through the review of literature the relevant nature of the mentoring program and how it complements the quantitative elements of the study.

Possible Implications for Practice

The results of this study are valuable to educational practitioners, administrators, and public school policy makers such as school boards and boards of directors. The implications include an exhaustive review of current best practices with regard to the academic success of ninth-graders. Leaders in secondary education may refer to this study to evaluate elements of proposed school reform initiatives in their own district. The variety of elements that form the freshman academy make this study very versatile in terms of reviewing comparable reform initiatives.

Process to Accomplish

Design

A quantitative, causal-comparative strategy was used in this study. The four hypotheses in this study were tested using a 2 x 2 factorial between-groups design. The independent variables in Hypotheses 1 and 2 were instructional model and gender. The independent variables in Hypotheses 3 and 4 were instructional model and socio-economic status measured by lunch status. The dependent variable in Hypotheses 1 and 3 was literary achievement. The dependent variable in Hypotheses 2 and 4 was mathematics achievement.

Sample

This study used ninth-grade students from two south-central Arkansas schools. The two schools were chosen based on their similar student demographic of ethnicity and socioeconomic status. The ninth-grade of School A consisted of 220 students; 151 of

those ninth-graders were study participants. Of the participants, 51% were female and 49% were male, and 57% of students were designated low socioeconomic status (free/reduced lunch status). The ninth-grade class of School B consisted of 275 students; 190 of those ninth-graders were study participants. Of the participants, 58% were female and 42% were male, and 39% of the students were designated low socioeconomic status (free/reduced lunch status).

Participants from School A were part of a 7-period structural design model on a campus that included students in grades 9-12. Participants from School B were part of freshman academy structural design model on a campus that included only students in grade nine. The freshman academy structural design model had been in place in School B for five years.

Participants from School A received instruction in mathematics and literacy from highly qualified teachers in their respective academic disciplines. The administration in School A did not use any systematic evaluation or recruitment tool in making staffing decisions for ninth-grade classrooms. Staffing for ninth-grade classrooms was based on teacher seniority and preference. Participants from School B received instruction in mathematics and literacy from highly qualified teachers in their respective academic disciplines. The administration in School B did not have a published evaluation or recruitment tool in making staffing decisions, but did indicate that personnel for the freshman campus were selectively chosen for work with ninth-grade students.

Instrumentation

In the 2012-2013 school year, students in School A received instruction in a traditional high school, and students in School B received instruction in an established

freshman academy. At the conclusion of the academic year, students took both the Arkansas Benchmark Exam and the End of Course Algebra I Exam. The Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) is comprised of criterion-referenced test and norm-referenced test components. For this study, the ACTAAP End of Course Algebra I Exam was used to measure student achievement in mathematics, while the ACTAAP Iowa Test of Educational Development was used to measure student achievement in literacy. The examinations consist of multiple-choice and open-response questions that directly assess student knowledge. The Arkansas Algebra Mathematics Curriculum Framework is the basis for development of the Algebra I End of Course Examination, while the Iowa Test of Educational development is directly related to the curricular goals outlined within the Arkansas Curriculum Frameworks for Mathematics, English Language Arts, and Science (Arkansas Department of Education, 2009).

Data Analysis

Hypothesis 1 was analyzed by using a 2 x 2 factorial ANOVA with condition by gender as factors and the literacy achievement measured by the Arkansas Benchmark Exam Score for literacy as the dependent variable. Hypothesis 2 was analyzed using a 2 x 2 factorial ANOVA with condition by gender as factors and mathematics achievement measured by the End of Course Algebra I Exam as the dependent variable. Hypothesis 3 was analyzed using a 2 x 2 factorial ANOVA with condition by socioeconomic status as factors and literacy achievement measured by the Arkansas Benchmark Exam Score for literacy as the dependent variable. Hypotheses 4 was analyzed using a 2 x 2 factorial ANOVA with condition by socioeconomic status as factors and mathematics

achievement measured by the End of Course Algebra I Exam score as the dependent variable.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this study was to determine the impact of a freshman academy versus the impact of a traditional high school on mathematics and literacy achievement of ninth-graders in two south-central Arkansas high schools. A survey of related literature indicated that the academic success of students dropped dramatically in the ninth-grade year. The research cited a number of factors that contributed to the poor academic performance of students in the ninth-grade year and illustrated the importance of the ninth-grade year as a foundation for academic success throughout high school. The research further highlighted the negative long term social and economic impact that ninth-grade failure rates had on local and state communities. Finally, the related literature addressed the multi-faceted efforts that educational practitioners have made to reform, redesign, or restructure the ninth-grade year in order to improve freshman academic performance.

This literature review specifically examines the freshman academy model and places it within the context of past and present education reform in the United States. In addition, this review of related literature addresses five areas that are essential to gauging the impact of freshman academies: (1) identification of the ninth-grade year as the linchpin year of success in high school; (2) review of the negative economic impact of ninth-grade failure rate; (3) identification of the critical attributes of a freshman academy;

(4) effects of a freshman academy on student achievement; and (5) additional impacts of enrollment in a freshman academy.

Historical Background of Public Education Reform in the United States

Since the inception of the first models of public education in the United States, external forces such as political agendas, religious influence, economic changes, and social movements have all molded public education into its current form. The American public education system has a long history of being a dynamic institution that is invariably susceptible to popular culture, as well as constant voices of reform.

The First Schools and the Spirit of Reform

In *School: The Story of American Public Education*, authors Tyack, Kaestle, and Ravitch (2001) documented the evolution of American public education from the early colonial practices through the accountability movement of the 2000s. Kaestle (1983) described the "common schools" of the mid-19th century as schools that "were funded by local property taxes, charged no tuition, open to all White children, governed by local school committees, and were subject to a modest amount of state regulation" (Tyack et al., 2001, p.11). Tyack et al. (2001) noted that the inception of the common school had its foundation in at least two decades of colonial debate in which the agrarian families claimed most of the responsibility for a child's learning, while famous political leaders and statesmen of the time endorsed a more widespread, systematic, and publicly supervised system of education. They asserted that notable leaders like Thomas Jefferson and Noah Webster argued that the future of the republic depended on an educated citizenry. Tyack et al. stated that the average American voter, however, took little initial interest in reforming the colonial mode of education. The debates that helped transition a

young America from the colonial system of education to the adoption of the common school fostered a national culture of ongoing school reform.

By the 1840s, industrialization and immigration changed the social landscape of America. The growth of cities and the presence of a large number of immigrants raised important issues about "moral education, common public values, and education for economic expansion" (Cremin, 1977, p. 42). Again, Cremin (1977) noted that the spirit of debate arose as people in larger, urban areas pushed for the establishment of a state common school system while those in small, rural areas feared such government interference. In addition, some protestant Christian religious groups which were used to shaping the curriculum of local schools, feared state governance of the common school system. By 1900, however, the majority of Americans preferred a state regulated school system that was allowed to retain a large degree of local control and funding (Cremin, 1977).

The Spirit of Reform and the Social Landscape

In just over 100 years, the system of public education in America had proven to be an institution susceptible to change and reform. While the prevailing question of the 19th century had been whether or not to create statewide systems of education, the prevailing questions of the early 20th century were what to teach and whether to give the same kind of education to all children (Kaestle, 1983).

Once again, the social landscape of the country played an important role in answering these questions. At the height of immigration before World War I, social reformers teamed with business groups and lobbied for industrial and vocational education programs in the public schools. Ironically, these programs were designed to

reduce the number of years a student spent in school so that children could begin job training sooner (Tyack et al., 2001). The federal government supported the movement via federal funding in 1917. Ravitch (1983) described the system of public education following World War I in this way:

> …the nation's schools had reached a point of apparent equilibrium in their programs: access to schooling was nearly universal, and students were tested for their intellectual aptitude and then assigned to the appropriate vocational or academic track. This procedure of assigning children to different curricular tracks in the eighth or ninth-grade was considered scientific at the time, even though it shunted large numbers of students away from the study of history, literature, foreign languages, or advanced courses in mathematics and science. Nonetheless, for many children from impoverished circumstances, the public schools offered bountiful opportunity for advancement despite vocation tracking. The "system" appeared to be working well indeed. (p. 68)

The guiding of children into specialized curricular tracks and ability grouping was facilitated after World War I by using group intelligence tests (Tyack et al., 2001). Up to this point, education seemed to be headed in the right direction.

The Spirit of Reform and Federal Influence

In 1957, the American public education system that "appeared to be working well indeed" (Ravitch, 1983, p. 68) fell under sharp criticism. Until that time, school reformers had convinced the public that education should be left to education experts. When the Soviet Union launched Sputnik, the first space satellite, the American press immediately

shifted the blame for the United States' failure to beat the Soviets into space to schools (Tyack et al., 2001). Government reaction to the negative publicity was to pass the National Defense Education Act of 1958 (Tyack et al., 2001). This piece of legislation provided federal funding for the post-secondary education of students for the study of mathematics and sciences and appropriated money for the building of new schools. The intent of the National Defense Education Act (1958) was to encourage increased academic rigor at all levels of education. The attempt of the federal legislation to increase academic rigor was almost immediately upstaged by the political and social turmoil of the 1960s. Still, the system boasted successes such as providing social mobility to low-income students, assimilating newcomers to American society, creating a sharp decline in illiteracy, and creating a steady rise in educational attainment (Tyack et al., 2001).

The spirit of reform in the 1960s and 1970s was grounded most firmly in efforts toward racial integration in the public school system. There was evidence that high school curriculum became more driven by student choice. The 1960s and 1970s revealed a gradual implementation of student curricular choice and ended some of the rigid curricular tracks that were prevalent in high schools during the 1950s (Lee & Ready, 2009). However, a review of literature did not reveal any evidence of a national movement regarding instructional process or curriculum planning. In 1983, however, a presidential commission of corporate and public leaders and educators reported their assessment of public schools in *A Nation at Risk* (United States National Commission on Excellence in Education, 1983). This report linked poor student performance on standardized tests to America's poor economic performance in the global marketplace (Tyack, 1995). Reform movements moved into high gear after the publication of *A*

Nation at Risk. States increased high school graduation requirements, lengthened the school year, and added more standardized tests (Tyack, 1995). In addition, states mandated curricular standards and accountability of principals, teachers, and students for test scores. The curriculum demands shifted from industrial and craft skill sets to more rigorous academic courses (Tyack et al., 2001).

The spirit of reform sparked by *A Nation at Risk* carried through the 1990s and 2000s as United States presidents, policy makers, local school boards, and education practitioners sought to improve student academic achievement. In 2000, President George W. Bush reauthorized the Elementary and Secondary Education Act as No Child Left Behind (NCLB) which continued the accountability movement in public education (Tyack et al., 2001)

The Spirit of Reform and Best Practices

Using the calls for education reform of the 1990s as a springboard, the National Association of Secondary School Principals (NASSP, 1999,2004) published *Breaking Ranks: The Comprehensive Framework for School Improvement* in 1999 and later published *Breaking Ranks II: A Guide to High School Reform* in 2004. These publications, compiled and promoted by secondary school principals, contained research based successful practices, real-life examples of high schools at various stages of reform, a step by step approach to change, obstacles to avoid, and resources from which to draw. Many of the recommendations promoted in these books can also be found in the structural framework for improving student achievement during the ninth-grade year.

According to the NASSP (2004) heterogeneous grouping of students, for example, resulted in higher achievement of struggling learners In addition,

interdisciplinary teaming and the formation of smaller learning communities increased the sense of teacher ownership and accountability for student achievement. The NASSP (2004) also suggested that the implementation of some form of advisory program allowed all students to connect to a significant adult, to themselves, to their classmates, and to their school community as a whole. These best practices are individually examined later within the chapter.

The Importance of the Ninth-Grade Year

The transition from middle school to high school is crucial because it sets the tone for high school graduation (Hertzog, 2006). Hertzog (2006) summarized three significant differences that students experience in the transition from middle school to high school. First, students began to accrue credits toward graduation in the ninth-grade. Second, middle school teachers worked in teams to deliver instruction in core subjects while a high school teacher taught multiple grade levels. Third, the middle school concept allowed students to express their understanding of subject mastery in various ways while the high school approach is based on competition for honors and class rank.

McCallumore and Sparapani (2010) systematically described *the ninth-grade problem* as a complex situation with both external and internal facets. Like Hertzog, McCallumore and Sparapani also cited that students in the ninth-grade were required for the first time to earn passing grades in core courses and were required for the first time to complete required courses for graduation. According to the report, ninth-graders also had the lowest grade point averages, the most missed classes, the greatest number of failing grades, and more discipline referrals than any other high school grade level. In addition, approximately 22% of students repeated the ninth-grade, which caused the ninth-grade

class to have the highest enrollment. Additional data from the National High School Center (2007) suggested that the actual number of students repeating the ninth-grade in some states could be as high as 72%. This situation resulted in some ninth-grade enrollments being double the size of the senior class. Another challenge that ninth-graders faced was the rising use of exit examinations and heightened graduation requirements (McCallumore & Sparapani, 2001). In addition, when a state mandated new or additional graduation requirements, the incoming freshman class was always the first to experience the effects of the increased number of graduation requirements (McCallumore & Sparapani, 2001).

Additional factors highlighting the complexity of the ninth-grade year go beyond the increased external expectations and requirements. Cooper and Liou (2007) cited that the ninth-grade year was a time in which students could experience loneliness, isolation and disconnection. Fritzer and Herbst (1996) suggested that transferring from smaller middle school settings to a larger high school created a transition period that was frequently marked by declining academic performance, increased absences, and increased behavioral disturbances. Social concerns such as getting lost in a new school or being bullied by older students also created a challenge for ninth-graders transitioning to high school (Akos & Galassi, 2004). Students who failed to adapt to the new expectations and requirements of high school could dropout as early as the end of the ninth-grade (Cooper & Liou, 2007).

Negative Economic Impact of Ninth-Grade Failure Rate

Student success in the ninth-grade directly affects the high school graduation rate, and as a result, has a direct impact on the economy. In August 2008, the Arkansas Task

Force on Higher Education, Remediation, Retention, and Graduation Rates (2008) published the *Access to Success* report that suggested a direct correlation between economic prosperity and educational attainment. According to the report, "because of the strong correlation between educational attainment and state wealth, states that have fallen behind educationally and economically are implementing bold initiatives to educate their citizens" (p. 7). The statistics presented in the report illustrated the decreased earning power of individuals who failed to complete high school and pursue a post-secondary degree.

In addition, the United States Census Bureau (2012) reported that four of the five counties with lowest per capita income in Arkansas are in east and south central Arkansas. South central Arkansas is currently experiencing a decline in economic productivity and development as well as a decline in population. According to Gottlob (2007), the annual estimated cost of high school dropouts to a state was $3,000-$5000 per drop out. Further, Gottlob estimated that high school dropouts earned approximately one-third less than high school graduates for at least the last 25 years. This relationship between economy and education has spurred educational reformers to look more closely at the redesign of the freshman year.

Critical Attributes of a Freshman Academy, Heterogeneous Classes, and Class Size

Since Lounsbury and Johnston (1985) cited ability grouping as an educational practice that is detrimental to student achievement and practice that is not aligned with the developmental needs of 14-year-olds, educators have largely abandoned the use of homogeneous classroom groupings. In the SREB publication, *Redesigning the Ninth-Grade Experience*, SREB director Gene Bottoms (2008) indicated that a freshman

academy should organize students into heterogeneous classes. The key was to avoid creating an academic environment that consisted of only at-risk students. Heterogeneous classes also helped create a school culture that helped ninth-graders adjust to the social changes inherent in transitioning to a high school campus (Bottoms, 2008).

Chatman (2001) indicated that demographic heterogeneity was beneficial to the development of cooperative norms in that it prepared students to be successful in communities and workplaces that consisted of diverse cultures, ethnicities, and people of various socio-economic backgrounds. Slavin (1990) indicated a positive correlation between student academic achievement and the heterogeneity of student ability grouping.

The NASSP (2004) suggested that the creation of smaller learning communities led to improved student achievement. However, Lindsey (1984) indicated that there was no relationship between class size and student achievement. McIntosh and White (2006) held that grade restructuring and the move to ninth-grade-only buildings were not effective when the restructuring was used only to reduce overcrowding issues. Donegan (2008) cautioned that many schools have abundant discussion about redesigning the ninth-grade around certain critical attributes, however, there is very little significant implementation of the new practices.

Instructional Facilitators and Team Teaching

Lounsbury and Johnston (1985) identified teacher-centered instruction as an educational practice poorly aligned with developmental needs of students. Bottoms (2008) suggested that successful freshman academies appoint an instructional facilitator to help teams of teachers with instructional planning, curriculum design, and uniform assessment. Teaming teachers is a strategy borrowed from the middle school model of

instruction. In addition, teachers in the academy should have a common planning period for building lessons and planning how to address the unique needs of students. The NASSP (2004) also found improved student achievement resulted when schools implemented interdisciplinary teams of teachers. The SREB also identified that successful freshman academies encouraged and assigned the district's best teachers to teach ninth-grade (Bottoms, 2008).

Mentor Relationships

Effective freshman academies create a supportive educational culture by helping students develop a mentor relationship with academic advisors who offer guidance with academic choices as well as social and emotional challenges that freshmen face during the transition from middle school to high school. These relationships are fostered during a defined advisory period. Holland and Mazzoli (2001) emphasized the importance of creating a culture of learning that was about not only academics but also about relationships. Sims (2010) attributed a student mentoring program to increased student retention, decreased truancy, and fewer behavior and discipline issues. Levin (2005) cited the benefits of an effective mentoring program as an avenue for tutoring, creating a sense of belonging, and "making high school less scary."

Hattie (2009) suggested that the most important influence on student achievement was the relationship between the teacher and the students. Goodwin (2011) suggested the mentor teacher should create a classroom environment that is warm and empathetic and establishes a sense of community within the classroom where students respect one another. Donegan (2008) warned against creating advisory programs that were crammed

with too much content, too many students for one advisor to mentor, and too few meeting times to build meaningful mentor relationships.

Student Achievement, Ethnicity, Gender, and Socioeconomic Status

Much of the existing literature on freshman academies examined the impact of freshman academies on academic achievement with regard to at least two variables: gender and ethnicity. Research findings associated with ethnicity were widely varied from study to study. Because each study was designed to measure student academic achievement with a variety of instruments of standardized assessment or grade point averages, the impact of a freshman academy on student achievement is still inconclusive.

Styron and Peasant (2010) examined the impact of a freshman academy on student achievement by ethnicity and found that Non-White students in a freshman academy had a higher mean score than their counterparts in a non-academy setting. The subjects examined in this study consisted of 50 randomly selected, first-time ninth-grade students who attended traditional high schools and 50 randomly selected, first-time ninth-grade students who were enrolled in freshman academies. The researchers measured academic achievement between the two groups by comparing standardized test scores on both Biology and Algebra I exams. In all, six schools from three different regions of the state of Mississippi were included in the study. Each school had a minimum enrollment of 1000 students in grades 9-12, and each school had at least 60% of student enrollment qualified for free or reduced lunch status. Styron and Peasant suggested the positive impact a freshman academy had on closing the achievement gap between White and non-White students. In the study, White students in the non-academy setting scored 40 points

higher compared to non-Whites, and White students in an academy setting scored less than one point higher compared to non-Whites.

Leonard (2011) compared the academic achievement of two separate graduating classes from the same east Tennessee high school. One of the classes had participated in a traditional high school while the other class had participated in a freshman academy. The class that participated in a traditional high school consisted of 207 students while the class that participated in the freshman academy consisted of 209 students for a combined 416 participants in the study. Leonard compared academic achievement by gender and ethnicity by using student grade point averages (GPA). Leonard found no statistically significant difference in achievement as measured by GPA between White students in an academy setting versus White students in a non-academy setting. In addition, Leonard also found no statistically significant difference in achievement as measured by GPA between non-White students in an academy setting versus non-White students in a non-academy setting.

Barbour (2009) also examined the effects of a freshman academy on academic achievement by race and gender. The study consisted of 1,165 participants in three urban high school settings in middle Tennessee. The researcher found that student achievement as measured by GPA did increase minimally among Non-white students in an academy model versus their counterparts in a non-academy model. However, in the same study she found that increase in achievement of White students in an academy model was non-existent when compared to their counterparts in a non-academy setting.

Styron and Peasant (2010) also examined the impact that freshmen academies had on student achievement by gender and found that the differences in male and female

academic achievement were not statistically significant. Leonard (2011) found that the impact that freshmen academies had on the academic achievement of female students as measured by GPA was not statistically significant. However, males who had participated in a freshman academy had statistically significant higher grade point averages than their cohorts who had not participated in a freshman academy.

Additional Effects of Enrollment in Freshman Academies

Additional results of implementing a freshman academy included improved student attendance, improved student behavior, and increased teacher morale (McIntosh & White, 2006). Chmelynski (2004) noted the decreased number of disciplinary referrals between students in a freshman academy and those not in an academy. McIntosh and White (2006) also found participation in a freshman academy contributed to a reduction in the number of freshmen failing classes.

McCallumore and Sparapani (2010) cited one disadvantage of implementing a freshman academy is that students essentially have two ninth-grade years: one in the academy and one when they begin school at the 10-12th-grade building. The NASSP (2004) echoed the concern by describing the challenges that schools face in offering follow-up support to academy students as they move on to the 10th grade.

McIntosh and White (2006) noted that in some cases, the freshman academy model fostered rivalries between teachers who become more committed to the academy than to the school as a whole. Finally, NASSP (2004) reported the challenges encountered in implementing a freshman academy included staffing issues as a result of staff having to be shifted out of other departments and into the academy. In addition, the

report highlighted the challenge of facility needs as the academy model called for designating a dedicated site for the school within a school.

Conclusion

The purpose of this study was to determine the impact of a freshman academy versus a traditional high school on the mathematics and literacy achievement of ninth-graders in two south-central Arkansas schools, specifically addressing gender and assigned socioeconomic status of students. The review of literature indicated that the freshman academy model and its attributes are situated firmly in the current best practices continuum of public education reform. Though there were some limitations with the model such as inadvertently creating teacher rivalries and the challenges of meeting facility requirements. The literature review further highlighted the importance of student success in the ninth-grade year as well as the negative implications of ninth-grade failure rates on both state economy and individual earning power.

The review also recognized earlier studies of the impact of freshman academies on student achievement with regard to ethnicity and gender. Subsequently, the variable of ethnicity was not explored. However, a review of the literature relative to freshmen academies determined that significant gaps existed. While gender and ethnicity have been addressed, there are fewer studies regarding gender relative to ninth-grade academies. There are not studies, in fact, that have been conducted within the state of Arkansas. Finally, no studies were found to review related to freshmen academies and impact to academic achievement by socioeconomic status.

CHAPTER III

METHODOLOGY

As revealed in the review of literature, successfully transitioning students from middle school to high school is a challenging and complex endeavor critical for securing a solid foundation for academic success throughout high school. Problems such as low levels of student engagement and high ninth-grade failure rates are compounded by the extensive economic challenges created by high school dropouts (Bottoms, 2008). Educators' awareness of the challenges facing adolescents as they begin the ninth-grade year help them to attentively and effectively address excessive failure rates, declining student engagement, and the effects of dropping out of high school (Donegan, 2008). The way in which educational practitioners respond to the unique needs of ninth-graders during the transition to high school was a critical concern of this study.

Because the existing body of research illustrated the ninth-grade year as a pivotal year in terms of adjustment and achievement, educational practitioners have created a number of initiatives designed to promote success of ninth-graders (Donegan, 2008). One such initiative is the implementation of freshman academies. Existing studies on the impact of freshman academies versus traditional high schools on student achievement revealed varying results. Styron and Peasant (2010) and Leonard (2011) examined participants by gender and presented mixed findings, while no studies that examined participants categorized by socioeconomic status were found.

Of the purposes of this study, the researcher generated the following hypotheses:

1. No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam.
2. No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam.
3. No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam.
4. No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam.

This chapter discusses the research design, the process of obtaining a sample, and a description of the sample population. The instrument used to measure student achievement was also discussed, and the data collection and statistical analysis processes was outlined. Finally, the limitations of the study were summarized.

Research Design

A quantitative, causal-comparative strategy was used in this study. A causal-comparative design was appropriate because two groups with a differing variable (academy model versus traditional high school) were compared on a dependent variable (academic achievement) (Gay, Mills, & Airasian, 2012). The four hypotheses in this study were tested using a 2 x 2 factorial between-groups design. According to Morgan (2011), a 2 x 2 factorial between-groups design is appropriate because there was more than one group difference independent variable (freshman academy versus traditional high school), and each level of each independent variable (gender and socioeconomic status) was possible in each level. The independent variables in Hypotheses 1 and 2 are instructional model and gender. The independent variables in Hypotheses 3 and 4 were instructional model and socio-economic status measured by free or reduced lunch eligibility. The dependent variable in Hypotheses 1 and 3 was literary achievement. The dependent variable in Hypotheses 2 and 4 was mathematics achievement.

Sample

This study used ninth-grade students from two south-central Arkansas schools. The two schools were chosen based on similar student demographic data relative to ethnicity and socioeconomic status. Though ethnicity was not a population subgroup considered for this study, the researcher controlled for ethnicity by choosing two schools with similar ethnic makeup. This is an acceptable method for controlling extraneous variables in causal-comparison studies (Gay et al., 2012). The two population subgroups examined in this study were gender and socioeconomic status as determined by free/reduced lunch eligibility.

According to Gay et al. (2012), stratified sampling is an appropriate method of selecting equal size samples from subgroups when subgroup comparisons are desired. Before stratified sampling of the population, the researcher removed participants from each school data set who did not have test scores from both the Benchmark Exam and the End-of-Course Algebra I Exam. The researcher then identified the variables (gender and assigned socioeconomic status) and strata to be represented in the sample from each school. Student gender was designated as either male or female while student socioeconomic status was designated as free/reduced lunch participant or free/reduced lunch non-participant. Next, all members of each population were identified as belonging to two of the identified subgroups. Finally, an equal number of individuals from each identified subgroup was randomly selected by using Microsoft Excel to randomly assign each participant a number and then order them from least to greatest. After the randomization, the first thirty participants in each subgroup were selected for the study.

The ninth-grade participants from School A consisted of 151 students, 51% female, 49% male, with 39% designated as being of low socioeconomic status (free/reduced lunch eligible). The ninth-grade participants from School B consisted of 250 students, 58% female, 42% male, with 26% designated as being of low socioeconomic status (free/reduced lunch eligible).

Participants from School A were part of a seven-period traditional high school model on a campus that included students in grades 9-12. Participants from School B were part of freshman academy model on a campus that included only students in grade 9. The freshman academy model had been in place in School B for five years.

Participants from School A received instruction in mathematics and literacy from highly qualified teachers in their respective academic disciplines. The administration in School A did not use any systematic evaluation or recruitment tool in making staffing decisions for ninth-grade classrooms. Staffing for ninth-grade classrooms was based on teacher seniority and preference.

Participants from School B received instruction in mathematics and literacy from highly qualified teachers in their respective academic disciplines. The administration in School B did not have a published evaluation or recruitment tool in making staffing decisions, but did indicate that personnel for the freshman campus were selectively chosen for work with ninth-grade students.

Participants from both schools took both the End-of-Course Algebra I Exam and the Arkansas Benchmark Exam. Students who did not have scores from both of these assessments were excluded from this study. This is relevant to this study for two reasons. First, in Arkansas, many students who excel in mathematics were enrolled in Algebra I in the 8th grade and took the End-of-Course Algebra I Exam at the conclusion of the 8th grade year. Subsequently, the mathematics achievement data analyzed in this study were void of top performing students in mathematics. Second, in Arkansas, students with significant learning disabilities in Language Arts were administered an alternative assessment to the Arkansas Benchmark Exam. Subsequently, the literacy achievement data analyzed in this study were void of low performing students in literacy.

Instrumentation

In the 2012-2013 school year, students in School A received instruction in a traditional high school, and students in School B received instruction in an established

freshman academy. At the conclusion of the academic year, students in both schools took both the Arkansas Benchmark Exam and the End-of-Course Algebra I Exam. The ACTAAP is comprised of criterion-referenced test and norm-referenced test components. For this study, the ACTAAP End-of-Course Algebra I Exam was used to measure student achievement in mathematics, while the ACTAAP Iowa Test of Educational Development was used to measure student achievement in literacy. The examinations consist of multiple-choice and open-response questions that directly assess student knowledge. The Arkansas Algebra Mathematics Curriculum Framework is the basis for development of the Algebra I End-of-Course Examination, and the Iowa Test of Educational development is directly related to the curricular goals outlined within the Arkansas Curriculum Frameworks for Mathematics, English Language Arts, and Science (Arkansas Department of Education, 2009).

The Arkansas Department of Education has contracted with Questar Assessment, Inc. for the development, production, distribution, and collection of the Algebra I End-of-Course Examination materials. According to Gay et al. (2012), validity is the most important characteristic a test or measure can have. Both the End-of-Course Algebra I Exam and the Iowa Test of Educational Development have technically sound levels of reliability, validity, and fairness, based on the extensive research that underlies both the criterion-referenced test and norm-referenced test item sets (Arkansas Department of Education, 2009).

Data Collection

Permission was obtained from the superintendent of both school districts used in the study. The superintendent of each participating district was sent an email with a letter

attached explaining the study and requesting permission for use of the data. An electronic reply to the request was used as documentation of permission granted. After approval by the Harding Institutional Review Board, student scaled scores for literacy and mathematics for the Spring 2013 administration of the Augmented Arkansas Benchmark Exam and End-of-Course Algebra I Exam were collected for analysis. The participating districts provided student data in Microsoft Excel 2007 spreadsheets and sent the data electronically. All data were coded to maintain confidentiality; therefore, identities of individual students were concealed and the information was kept confidential. Data from the original test score reports for School A were downloaded into a Microsoft Excel document where student names were replaced with dummy codes and all other personally identifiable information was deleted. Data from School B were coded in a similar manner by personnel from school B and delivered to the researcher in a Microsoft Excel document with no personally identifiable information.

Analytical Methods

IBM Statistical Packages for the Social Sciences (SPSS) Version 22 was used for data analyses. Data for the each hypothesis were coded according to gender, free or reduced lunch eligibility and method of instructional delivery. The following codes were used for each participant: gender (0 = male, 1 = female), free or reduced lunch eligible (0 = participant, 1 = non-participant), and method of instructional delivery (0 = freshmen academy model, 1 = traditional high school model). The four hypotheses were then analyzed using the following statistical analysis:

To address the first hypothesis, a 2 x 2 factorial ANOVA was conducted using method of instructional delivery (freshman academy versus tradition high school) by

gender (male versus female) as the independent variables and the overall literacy achievement measured by ACTAAP Augmented Benchmark Exam as the dependent variable. The second hypothesis was analyzed by a 2 x 2 factorial ANOVA with method of instructional delivery (freshman academy versus traditional high school) by gender (male versus female) as the independent variables and the overall mathematics achievement measured by Arkansas End-of-Course Algebra I Exam as the dependent variable. The third hypothesis was analyzed by a 2 x 2 factorial ANOVA with method of instructional delivery (freshman academy versus traditional high school) by free or reduced lunch eligibility (participant versus non-participant) as independent variables and the overall literacy achievement measured by the ACTAAP Augmented Benchmark Exam as the dependent variable. The fourth hypothesis was analyzed using a 2 x 2 factorial ANOVA with method of instructional delivery (freshman academy versus traditional high school) by free or reduced lunch eligibility (participant versus non-participant) as independent variables and the overall mathematics achievement as measured by the Arkansas End-of-Course Algebra I exam as the dependent variable. To test all four null hypotheses, a two-tailed test with a .05 level of significance was used.

Limitations

The implementation of a freshman academy model of instruction varies from institution to institution. Therefore, the results of this study are most relevant to schools that implement models similar to the models presented in this study. A review of literature revealed a number of freshmen academy models and described the implementation of these models as a continuum from strict implementation to loose implementation of the practices of a freshman academy. Hertzog (2006) proposed there

must be no permanent template adopted for implementing a freshman academy. He contended that each class of students is unique and must be treated accordingly in the transition process. The model implemented in this study placed strong emphasis on the following aspects of a freshman academy: (1) mentoring relationships, (2) common planning periods for academy teachers, (3) strong cross-curricular planning, and (4) rigorous, college and career readiness standards for all participants. While these attributes are a common foundation for most freshman academies, institutions failing to implement one or more of these aspects may find the results of this study less relevant.

Another limitation of this study is that the freshman academy and the traditional high school methods of instruction were studied in two different yet demographically similar school districts in south-central Arkansas. Therefore, the researcher was not able to control for the variable of individual teacher competence in this study. In addition, the overall sampling for the study was very limited in scope with a combined population of 426 students

Finally, the research design for this study was non-experimental. The researcher was unable to manipulate the independent variables or randomly assign participants, which produced less conclusive evidence. However, this and the other limitations did not seem to exceed the typical circumstances that are encountered in using schools for research purposes.

CHAPTER IV

RESULTS

This chapter addresses the results of this study. The detailed analysis of each hypothesis is systematically explored. A brief review of participant demographics is also given. When appropriate, tables and graphs are used to display data that are relevant to the given analyses. The purposes of this study were to determine the effects by gender and socioeconomic status of a freshman academy versus a traditional high school on literacy and mathematics achievement as measured on the Arkansas Benchmark Exam for ninth-grade students in two south-central Arkansas high schools.

Demographics

This study used ninth-grade students from two south-central Arkansas schools. The two schools were chosen based on their similar student demographics for ethnicity and designated socioeconomic status. Although ethnicity was not a population subgroup considered for this study, the researcher controlled for ethnicity by choosing two schools with a similar ethnic makeup. The two population subgroups examined in this study were gender and socioeconomic status based on free or reduced lunch eligibility.

The participants from the ninth-grade class of School A consisted of 151 students: 51% female and 49% male, with 39% eligible to receive free or reduced-cost lunches. Of the participants, 87% were White, while 13% were Non-white. The participants from the ninth-grade class of School B consisted of 250 students: 58% female and 42% male, with

26% eligible to receive free or reduced-cost lunches. Of the participants, 91% were White and 9% were Non-white. The samples used in this study are recorded in Table 1.

Table 1

Demographics for Ninth-Graders in each Instructional Design

	Freshman Academy	Traditional High School
Male	30	30
Female	30	30
Free or Reduced Eligible	30	30
Not Free or Reduced Eligible	30	30

Statistical Assumptions

IBM Statistical Packages for the Social Sciences Version 22 was used to conduct all analyses. Before conducting the analyses, data were screened for data entry errors, missing values, outliers, and to test the assumptions associated with factorial ANOVA analysis. No data entry errors or missing values were identified. Furthermore, an examination of the box-and-whisker plots revealed no outliers. All assumptions of normality were also met.

Hypothesis 1

No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam. Table 2 displays the group mean values and standard

deviations by gender for literacy achievement scores in a freshman academy versus a traditional high school.

Table 2

Descriptive Statistics from ACTAAP Augmented Benchmark Literacy Scale Scores

Group	*M*	*SD*
Female Traditional	260.73	21.79
Female Freshman Academy	260.00	30.79
Male Traditional	257.87	26.57
Male Freshman Academy	240.67	35.81

To test the assumption of normal distribution, Kolmogorov-Smirnov statistics were examined and found to be statistically significant for Traditional Male KS (30) = .185, $p < .05$, thus violating the assumption of normality. However, an ANOVA is considered robust enough to handle such minor violations to the assumption of normality (Leech, Barrett, & Morgan, 2011). Normality test results were not statistically significant for Traditional Female KS (30) = .112, $p > .05$; Freshman Academy Male KS (30) = .130, $p > .05$; and Freshman Academy Female KS (30) = .099, $p > .05$. In addition, an observation of histograms and Q-Q plots indicated normal distribution of data.

After screening data and testing assumptions of normality, a 2 x 2 between groups Factorial ANOVA was conducted to evaluate the effects of method of instructional design (freshman academy versus traditional) by gender (female versus male) on literacy achievement as measured by the ACTAAP Augmented Benchmark Examination.

Because four comparisons were made using the same data and the small sample size, a Bonferroni adjustment was made to adjust the alpha level to the more stringent level of significance of $p < .0125$ (Pallant, 2006). Levene's Test of Equality of Variances was conducted within the ANOVA and indicated homogeneity of variance across groups, $F(3, 116) = 2.78$, $p = .044$. The results of the ANOVA are displayed in Table 3.

Table 3

Factorial ANOVA Results from ACTAAP Augmented Benchmark Examination Literacy Scale Scores

Source	*df*	*SS*	*MS*	*F*	*p*	*ES*
Gender	1	3696.30	3696.30	4.34	.040	0.04
Instruction Design	1	2412.03	2412.03	2.82	.095	0.02
Gender*Instr Design	1	2033.63	2033.63	2.39	.125	0.02
Error	116	98914.00	852.71			

Insufficient evidence existed based on the interaction of the variables to reject the null hypothesis, $F(1, 116) = 2.39$, $p = .125$. This suggested that the literacy achievement scores of males in a freshman academy ($M = 240.67$, $SD = 35.81$) were not significantly different from the literacy achievement scores of males in a traditional high school ($M = 257.87$, $SD = 26.57$) and that the literacy achievement of females in a freshman academy ($M = 260.00$, $SD = 30.79$) were not significantly different from the literacy achievement scores of females in a traditional high school ($M = 260.73$, $SD = 21.79$). Since there was no significant interaction of the variables, gender and method of instructional design were examined for main effect.

The main effect for gender was not significant, $F(1, 116) = 4.34$, $p = .040$, $ES = 0.04$. This suggested that literacy achievement scores of males ($M = 249.27$, $SD = 32.44$) and females ($M = 260.37$, $SD = 26.45$) were not significantly different from each other. The main effect for method of instructional design was not significant, $F(1, 116) = 2.82$, $p = .095$, $ES = 0.024$. This suggested that the literacy achievement scores of students in a freshman academy ($M = 250.33$, $SD = 34.52$) were not significantly different from the literacy achievement scores of students in a traditional high school ($M = 259.30$, $SD = 30.00$). Insufficient evidence existed to reject the null hypothesis. (See Figure 1).

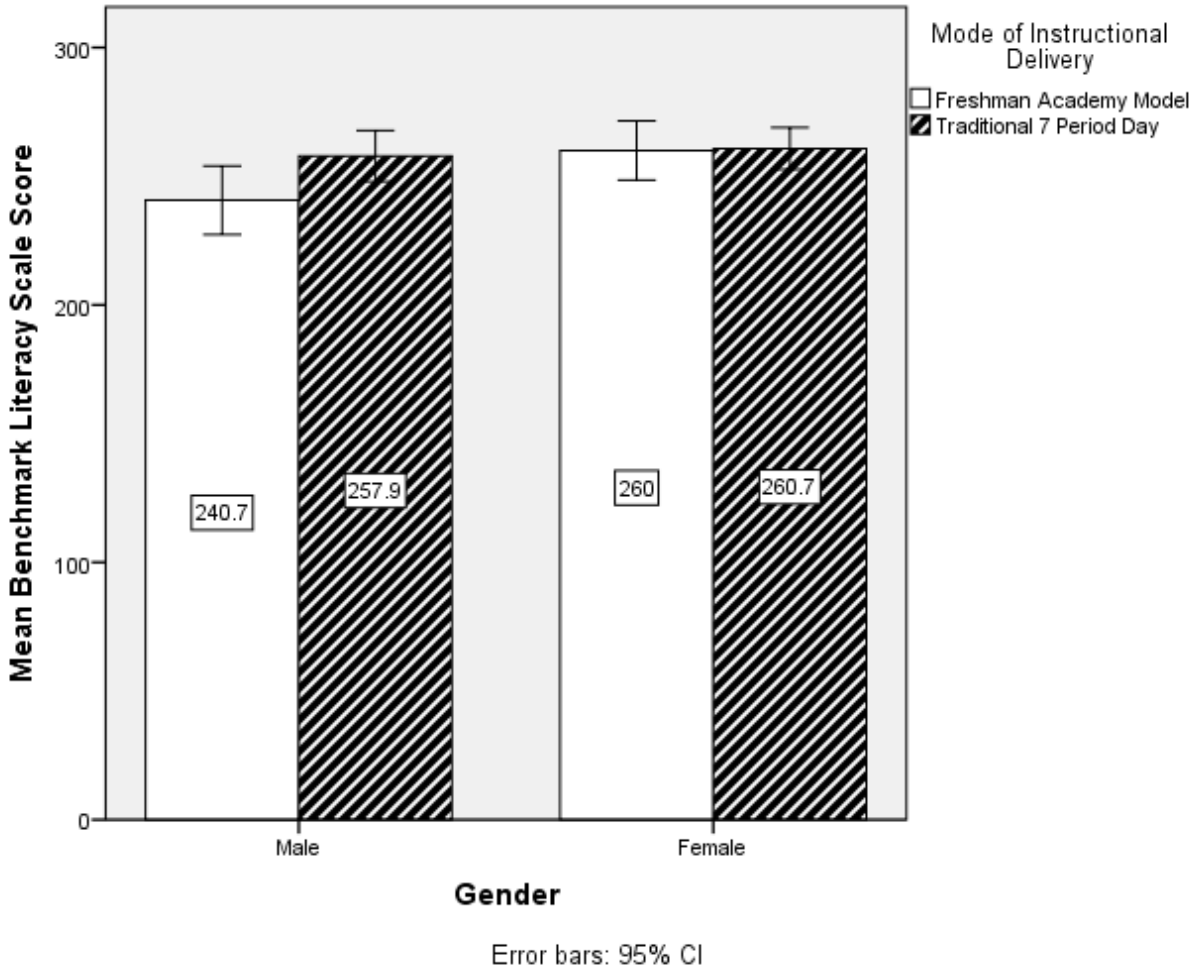

Figure 1. Literacy achievement scores by gender and instructional design.

There was no significant difference by gender on literacy achievement between students in a freshman academy and students in a traditional high school; therefore, the null hypothesis was not rejected.

Hypothesis 2

No significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam. Table 4 displays group means and standard deviations by gender for freshman academy versus traditional high school on mathematics achievement.

Table 4

Descriptive Statistics from End-of-Course Algebra I Exam

Group	*M*	*SD*
Female Traditional	237.53	27.11
Female Freshman Academy	239.97	23.35
Male Traditional	228.47	39.43
Male Freshman Academy	225.13	34.94

To test the assumption of normal distribution, Kolmogorov-Smirnov statistics were examined and were not statistically significant for Traditional Male KS (30) = .123, $p > .05$; Traditional Female KS (30) = .138, $p > .05$; Freshman Academy Male KS (30) =

.098, $p > .05$; and Freshman Academy Female KS (30) = .107, $p > .05$. In addition, observation of histograms and Q-Q plots indicated normal distribution of data.

After screening the data and testing assumptions of normality, a 2 x 2 between groups factorial ANOVA was conducted to evaluate the effects of method of instructional design (freshman academy versus traditional) by gender (female versus male) on mathematics achievement as measured by the End-of-Course Algebra I Exam. Because four comparisons were made using the same data and the small sample size, a Bonferroni adjustment was made to adjust the alpha level to the more stringent level of significance of $p < .0125$ (Pallant, 2006). Levene's Test of Equality of Variances was conducted within the ANOVA and indicated homogeneity of variance across groups, $F(3, 116) = 1.66$, $p = .179$. The results of the ANOVA are displayed in Table 5.

Table 5

Factorial ANOVA Results from End-of-Course Algebra I Exam

Source	*df*	*SS*	*MS*	*F*	*p*	*ES*
Gender	1	4284.08	4284.08	4.23	.042	0.035
Instruction Design	1	6.08	6.08	0.01	.938	0.000
Gender*Instr Design	1	249.91	249.91	0.25	.621	0.002
Error	116	117625.37	1014.01			

Insufficient evidence existed based on the interaction of the variables to reject the null hypothesis, $F(1, 116) = 0.25$, $p = .621$. This suggested that the mathematics achievement scores of males in a freshman academy ($M = 225.13$, $SD = 34.94$) were not

significantly different from the mathematics achievement scores of males in a traditional high school (M = 228.47, SD = 39.43) and that the mathematics achievement scores of females in a freshman academy (M = 239.97, SD = 23.35) were not significantly different from the mathematics achievement scores of females in a traditional high school (M = 237.53, SD = 27.11). Since there was no significant interaction of the variables, gender and method of instructional design were examined for main effect. The main effect for gender was not significant, $F(1, 116) = 4.23$, $p = .042$, $ES = 0.035$. This suggested that mathematics achievement scores of males (M = 226.80, SD = 36.97) and females (M = 238.75, SD = 25.12) were not significantly different from each other. The main effect for method of instructional design was not significant, $F(1, 116) = 0.25$, $p = .621$, $ES = 0.002$. This suggested that the mathematics achievement scores of students in a freshman academy (M = 232.55, SD = 30.40) were not significantly different from the mathematics achievement scores of students in a traditional high school (M = 233.00, SD = 33.86). Insufficient evidence existed to reject the null hypothesis. (See Figure 2).

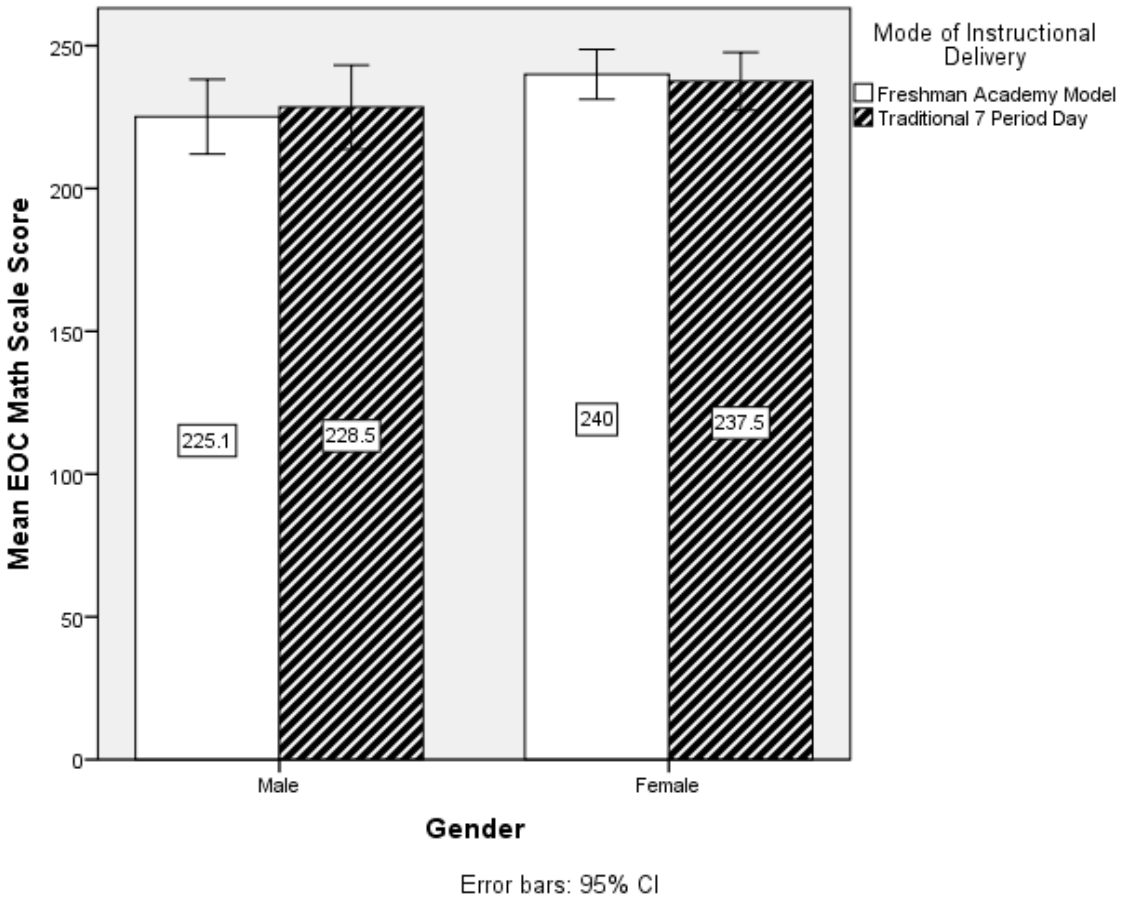

Figure 2. Mathematics achievement scores by gender and instructional design.

There was no significant difference by gender on mathematics achievement between students in a freshman academy and students in a traditional high school; therefore, the null hypothesis was not rejected.

Hypothesis 3

No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam. Table 6 displays the group means and standard

deviations by socioeconomic status for freshman academy versus traditional high school on literacy achievement.

Table 6

Descriptive Statistics from ACTAAP Augmented Benchmark Literacy Scale Scores

Group	*M*	*SD*
Free or Reduced Eligible Traditional	258.03	26.40
Free or Reduced Eligible Academy	252.57	34.58
Non-Eligible Traditional	260.57	22.01
Non-Eligible Freshman Academy	248.10	34.90

To test the assumption of normal distribution, Kolmogorov-Smirnov statistics were examined and no violations were found. Normality test results were not statistically significant for Freshman Academy Eligible KS (30) = .084, $p > .05$; Freshman Academy Non-Eligible KS (30) = .114, $p > .05$; Traditional Eligible KS (30) = .144, $p > .05$; and Traditional Non-Eligible KS (30) = .137, $p > .05$. In addition, observation of histograms and Q-Q plots indicated normal distribution of data.

After screening data and testing assumptions of normality, a 2 x 2 between groups factorial ANOVA was conducted to evaluate the effects of method of instructional design (freshman academy versus traditional) by socioeconomic status (students eligible for free or reduced-cost lunches versus students not eligible for free or reduced-cost lunches) on literacy achievement as measured by the ACTAAP Augmented Benchmark

Examination. Levene's Test of Equality of Variances was conducted within the ANOVA and indicated homogeneity of variance across groups, $F(3, 116) = 0.38$, $p = .771$. The results of the ANOVA are displayed in Table 7.

Table 7

Factorial ANOVA Results from ACTAAP Augmented Benchmark Examination Literacy Scale Scores

Source	*df*	*SS*	*MS*	*F*	*p*	*ES*
Instruction Design	1	2412.03	2412.03	2.68	.104	0.023
SES	1	28.03	28.03	0.03	.860	0.000
Instr Design*SES	1	367.50	367.50	0.41	.524	0.409
Error	116	104248.40	898.69			

Insufficient evidence existed based on the interaction of the variables to reject the null hypothesis, $F(1, 116) = 0.41$, $p = .524$. This suggested that the literacy achievement scores of students eligible for free or reduced-cost lunch in a freshman academy (M = 252.57, SD = 34.58) were not significantly different from the literacy achievement scores of students eligible for free or reduced-cost lunch in a traditional high school (M = 258.03, SD = 26.40) and that the literacy achievement scores of students not eligible for free or reduced-cost lunch in a freshman academy (M = 248.10, SD = 34.90) were not significantly different from students not eligible for free or reduced-cost lunch in a traditional high school (M = 260.57, SD = 22.01). Since there was no significant interaction of the variables, socioeconomic status and instructional design were examined for main effect.

The main effect for socioeconomic status was not significant, $F(1, 116) = 0.03$, $p = .860$, $ES = 0.000$. This suggested that literacy achievement scores between students eligible for free or reduced-cost lunches ($M = 255.30$, $SD = 30.63$) and students not eligible for free or reduced-cost lunches ($M = 254.33$, $SD = 29.60$) was not significantly different. The main effect for method of instructional design was not significant, $F(1, 116) = 2.68$, $p = .104$, $ES = 0.023$. This suggested that literacy achievement scores of students in a freshman academy ($M = 250.33$, $SD = 34.52$) were not significantly different from literacy achievement scores of students in a traditional high school ($M = 259.30$, $SD = 24.13$). Insufficient data existed to reject the null hypothesis. (See Figure 3).

Figure 3. Literacy achievement scores by socioeconomic status and instructional design.

There was no significant difference by socioeconomic status on literacy achievement between students in a freshman academy and students in a traditional high school; therefore, the null hypothesis was not rejected.

Hypothesis 4

No significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam. Table 8 displays the group means and standard deviations by socioeconomic status for freshman academy versus traditional high school on mathematics achievement.

Table 8

Descriptive Statistics from EOC Algebra I Exam

Group	*M*	*SD*
Free or Reduced Eligible Traditional	234.40	30.46
Free or Reduced Eligible Academy	234.23	27.32
Non-EligibleTraditional	231.60	37.43
Non-Eligible Freshman Academy	230.87	33.58

To test the assumption of normal distribution, Kolmogorov-Smirnov statistics were examined and no violations were found. Normality test results were not statistically significant for Freshman Academy Eligible KS (30) = .098, $p > .05$; Freshman Academy Non-Eligible KS (30) = .094, $p > .05$; Traditional high school Eligible KS (30) = .131, $p >$

.05; and Traditional high school Non-Eligible *KS* (30) = .127, $p > .05$. In addition, observation of histograms and Q-Q plots indicated normal distribution of data.

After screening data and testing assumptions of normality, a 2 x 2 between groups Factorial ANOVA was conducted to evaluate the effects of method of instructional design (freshman academy versus traditional) by socioeconomic status (free reduced versus not free reduced) on mathematics achievement as measured by the End-of-Course Algebra I examination. Levene's Test of Equality of Variances was conducted within the ANOVA and indicated homogeneity of variance across groups, $F(3, 116) = 1.10$, $p = .351$. The results of the ANOVA are displayed in Table 9.

Table 9

Factorial ANOVA Results from End-of-Course Algebra I Exam

Source	*df*	*SS*	*MS*	*F*	*p*	*ES*
Instruction Design	1	6.08	6.08	0.01	.940	0.000
SES	1	285.21	285.21	0.27	.603	0.002
Instr Design*SES	1	2.41	2.41	0.00	.962	0.000
Error	116	121871.23	1050.61			

Insufficient evidence existed based on the interaction of the variables to reject the null hypothesis, $F(1, 116) = 0.00$, $p = .962$. This suggested that mathematics achievement scores of students eligible for free or reduced-cost lunches in a freshman academy ($M = 234.23$, $SD = 27.32$) were not significantly different from mathematics achievement scores of students not eligible for free or reduced-cost lunches in a traditional high

school (M = 234.40, SD = 30.46) and that mathematics achievement scores of students eligible for free or reduced-cost lunches in a freshman academy (M = 230.87, SD = 33.58) were not significantly different from mathematics achievement scores of students not eligible for free or reduced-cost lunches in a traditional high school (M = 231.60, SD = 37.43). Since there was no significant interaction of the variables, socioeconomic status and method of instructional design were examined for main effect.

The main effect for socioeconomic status was not significant, $F(1, 116) = 0.27$, $p = .603$, $ES = 0.002$. This suggested that the mathematics achievement scores for students eligible for free or reduced-cost lunches (M = 234.32, SD = 28.68) were not significantly different from mathematics achievement scores for students not eligible for free or reduced-cost lunches (M = 231.23, SD = 35.26). The main effect for method of instructional design was not significant, $F(1, 116) = 0.01$, $p = .940$, $ES = 0.000$. This suggested that the mathematics achievement scores for students in a freshman academy (M = 232.55, SD = 30.40) were not significantly different from the mathematics achievement scores for students in a traditional high school (M = 233.00, SD = 33.86). Insufficient data existed to reject the null hypothesis (See Figure 4).

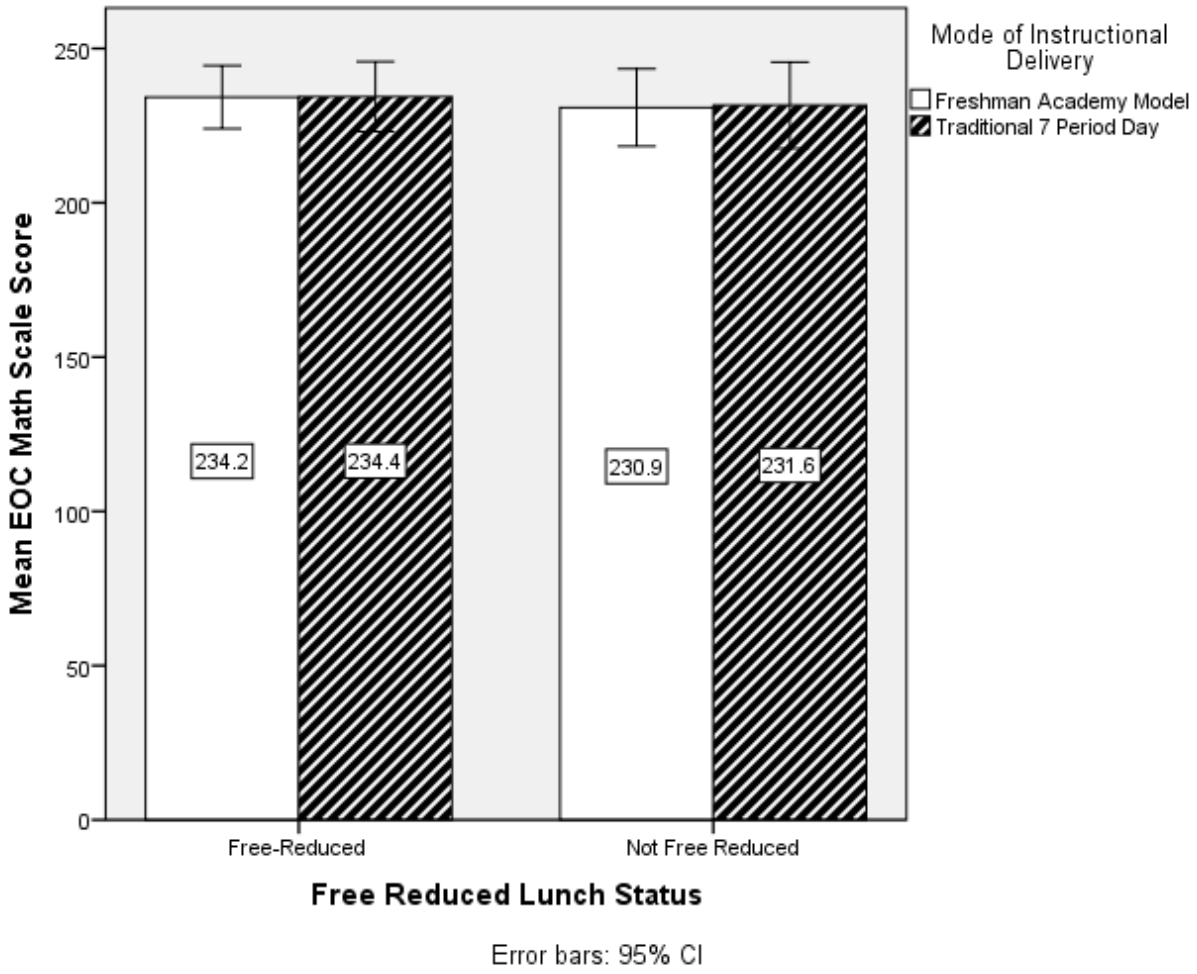

Figure 4. Mathematics achievement scores by socioeconomic status and instructional design.

There was no significant difference by socioeconomic status on mathematics achievement between students in a freshman academy and students in a traditional high school, therefore, the null hypothesis was not rejected.

Overall, there were no significant differences found for the interaction of variables for any of the four hypotheses. Further, there were no significant differences found for the main effects of the variables for any of the four hypotheses. Based on these results, the researcher failed to reject all four null hypotheses.

CHAPTER V

DISCUSSION

Successfully transitioning students from middle school to high school is a challenging and complex endeavor critical for securing a solid foundation for academic success throughout high school. Bottoms (2008) observed that the ninth-grade failure rate was higher than student failure rates at any other grade level. In addition, research presented by the SREB in 2008 suggested that ninth-graders were failing to connect high school studies to future goals. Low levels of student engagement most prevalent during the ninth-grade year resulted in a higher number of high school dropouts, which led to economic challenges on both a regional and national scale (Bottoms, 2008). Donegan (2008) described the ninth-grade year as the linchpin year because of the positive impact that a successful freshman year of high school could have on the remaining years of the high school career.

Because the research illustrated the ninth-grade year as such a pivotal year in terms of social adjustment and academic achievement, educational practitioners have created a number of initiatives designed to promote success of ninth-graders. One such strategy for addressing the challenges faced by ninth-graders is the freshman academy. While Hertzog (2006) proposed there must be no permanent template adopted for the implementation of a freshman academy, Bottoms (2008) identified the following common attributes of successful academy models: (a) a heterogeneous student mix, (b)

an instructional facilitator, (c) a common planning time for academy teachers, (d) a student-to-teacher ratio comparable to all other grade levels, and (e) a placement of best teachers in ninth-grade courses.

In contrast to the structure of a freshman academy identified by Bottoms (2008) is the traditional high school which Donegan (2008) described as school as usual. For this study, the traditional high school was defined as an instructional day in which ninth-grade students during their first year of high school participated in 45- to 50-minute class periods with little or no isolation from upperclassmen.

The focus of this study was to describe and compare the mathematics and literacy achievement of ninth-graders in two south-central Arkansas high schools. One high school implemented a freshman academy while the other was a traditional high school. The researcher collected and closely examined data for subgroups to determine whether the mathematics and literacy achievement of ninth-graders in the freshman academy were significantly different from those in a traditional high school. The subgroups examined for this study were gender and socioeconomic status.

This chapter provides the researcher's conclusions and interpretation of the findings. The researcher's conclusions are based on the findings of his research relative to the information contained in the literature review. Subsequently, implications of the study are discussed. Recommendations for potential practices and policies are outlined. Finally, this chapter contains considerations for future research.

Conclusions

All four hypotheses were analyzed by using a 2 x 2 between groups factorial ANOVA. Hypotheses 1 and 2 explored the interaction of the variables of gender and

instructional design on mathematics or literacy achievement. Hypotheses 3 and 4 explored the interaction of the variables of socioeconomic status and instructional design on mathematics or literacy achievement. To test the null hypotheses, the researcher used a two-tailed test with a .05 level of significance. Interaction and main effects were examined in each of the hypotheses. The following hypotheses were tested and used to determine conclusions.

Hypothesis 1

The first hypothesis stated that no significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam. There was no significant interaction of the variables of gender and instructional design. Literacy scores of males in a freshman academy were not significantly different from literacy scores of males in a traditional high school; likewise, literacy scores of females in a freshman academy were not significantly different from literacy scores of females in a traditional high school. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for gender was not significant. Literacy achievement of males was not significantly different from literacy achievement of females. Further, the main effect for instructional design was not significant. Literacy achievement scores of students in a freshman academy were not significantly different from the literacy achievement scores of students in a traditional high school.

Hypothesis 2

The second hypothesis stated that no significant difference will exist by gender between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam. There was no significant interaction of the variables gender and instructional design. Mathematics scores of males in a freshman academy were not significantly different from mathematics scores of males in a traditional high school and mathematics scores of females in a freshman academy were not significantly different from mathematics scores of females in a traditional high school. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for gender was not significant. Mathematics achievement of males was not significantly different from mathematics achievement of females. Further, the main effect for instructional design was not significant. Mathematics achievement scores of students in a freshman academy were not significantly different from the mathematics achievement scores of students in a traditional high school.

Hypothesis 3

The third hypothesis stated no significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on literacy achievement as measured on the Arkansas Benchmark Exam. There was no significant interaction of the variables of socioeconomic status (free or reduced-cost lunch eligible

versus non-eligible) and instructional design. Literacy scores of students eligible for free or reduced-cost lunches in a freshman academy were not significantly different from literacy scores of their counterparts in a traditional high school and literacy scores of students not eligible for free or reduced-cost lunches in a freshman academy were not significantly different from literacy scores of their counterparts in a traditional high school. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for socioeconomic status was not significant. Literacy achievement of students eligible for free or reduced-cost lunches was not significantly different from literacy achievement of students who were not eligible for free or reduced-cost lunches. This result was not typical and is discussed later in this chapter. Further, the main effect for instructional design was not significant. Literacy achievement scores of students in a freshman academy were not significantly different from the literacy achievement scores of students in a traditional high school.

Hypothesis 4

The fourth hypothesis stated no significant difference will exist by socioeconomic status between ninth-grade students receiving instruction in a freshman academy versus those students who are receiving instruction in a traditional high school on mathematics achievement as measured on the Arkansas Algebra I End-of-Course Exam. There was no significant interaction of the variables of socioeconomic status (free or reduced eligible versus non-eligible) and instructional design. Mathematics scores of students eligible for free or reduced-cost lunches in a freshman academy were not significantly different from mathematics scores of their counterparts in a traditional high school and mathematics

scores of students not eligible for free or reduced-cost lunches in a freshman academy were not significantly different from mathematics scores of their counterparts in a traditional high school. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for socioeconomic status was not significant. Mathematics achievement of students eligible for free or reduced-cost lunches was not significantly different from mathematics achievement of students who were not eligible for free or reduced-cost lunches. As with the main effect for socioeconomic status on literacy performance, this result was not typical and is discussed later in this chapter. Further, the main effect for instructional design was not significant. Mathematics achievement scores of students in a freshman academy were not significantly different from the mathematics achievement scores of students in a traditional high school.

In summary, in each of the four hypotheses, there was no significant interaction of variables. In Hypotheses 1 and 2, there was no significant interaction of the variables of gender and instructional design on mathematics or literacy achievement. In Hypotheses 3 and 4, there was no significant interaction of the variables of socioeconomic status and instructional design on mathematics or literacy achievement. In this study, little impact was revealed by gender or socioeconomic status on either mathematics or literacy achievement in a freshman academy versus a traditional high school. Further, there was no significant difference in mathematics or literacy achievement scores when each of the hypotheses was examined for the main effect of each variable. Mathematics and literacy scores of students receiving instruction in a freshman academy were not significantly different from those students receiving instruction in a traditional high school.

Finally, the examination of socioeconomic status for main effect revealed students eligible for free or reduced-cost lunches did not score significantly different in mathematics or literacy than those students not eligible. This result is incongruent with the existing body of academic research. The impact of poverty on academic achievement is a complex study. Research suggests that living in poverty correlates with a number of life challenges that prove detrimental to academic performance (Battle & Lewis, 2002; Caldwell & Ginther, 1996; Garner & Cole, 1986). As suggested by this study, however, simply living in poverty does not equate directly with poor academic performance. A brief review of the research based correlations of poverty and certain life challenges may help explain the atypical result. Students in poverty are more likely:

- To suffer abuse (Zuena et al., 2008).
- To suffer the stress from transience (Schafft, 2006).
- To worry over personal safety in the home and neighborhood (Pratt, Tallis, & Eysenck, 1997).
- Have disengaged parents (Hsuch & Yoshikawa, 2007).

One reason that participants eligible for free or reduced-cost lunches in this study did not perform significantly different from students who were not eligible might be that the eligible participants, though low-income, did not experience any of the challenging life circumstances that research suggests may accompany poverty. Another reason for the atypical results may be the impact of supportive communities and informal mentoring that characterized both School A and School B. This impact is difficult to quantify but must not be ignored when exploring the actions and initiatives that may negate the negative effects of poverty on academic performance. Finally, the result of no significant

difference in academic performance of the study participants may be a result of the limited size of the population sample. This limitation is also discussed later in this chapter.

The overall sense of community, small learning communities within the ninth-grade, the role of formally assigned mentors, or the informal mentoring role filled by classroom teachers and other school personnel are all recommended practices for the successful implementation of a freshman academy. Although School B utilized a formal mentoring program as part of a freshman academy, School A may have attained the positive benefits of this aspect of the freshman academy through other means. Consideration should be given that the academic benefits of meaningful mentoring relationships and a strong sense of community may supersede other elements of instructional design.

Implications

The outcomes of this study must be examined within the context of the assertion of Hertzog (2006) that each class of ninth-grade students is unique and must be treated accordingly in the transition process. The result of this study of no significant difference in mathematics or literacy achievement by gender or socioeconomic status contribute to the mixed results of the studies examined in the review of literature. Some of the findings in this study remained consistent with the results of the studies examined in the review of literature.

Expanded Measure of Academic Achievement and Additional Subgroup

While previous studies examined the impact on a variety of factors impacted by the implementation of a freshman academy, this study uniquely narrowed and measured the impact of a freshman academy by gender and socioeconomic status specifically on

mathematics and literacy achievement as measured by standardized assessments. In contrast, Barbour (2009) and Leonard (2011) measured the impact of a freshman academy by gender and ethnicity on overall academic achievement as measured by student GPA. In addition, Styron and Peasant (2010) examined the impact of a freshman academy by ethnicity on academic achievement in Biology and Algebra I as measured by standardized assessments. Specifically, this study expanded the definition of academic achievement in the existing body of research to include the literacy achievement of ninth-graders as measured on a standardized assessment.

Moreover, this study expanded the subgroups examined in the existing body of research to include a study of the impact of freshman academies by socioeconomic status. Barbour (2009), Leonard (2011), and Styron and Peasant (2010) each examined the impact of a freshman academy by ethnicity. Barbour (2009) and Leonard (2011) both examined the impact of a freshman academy by gender. Styron and Peasant (2010) noted that 60% of study participants qualified for free or reduced-cost lunches, however, participant achievement scores were not grouped and examined specifically for students who were free or reduced-cost lunch eligible. The current study deliberately focused on the impact of a freshman academy by socioeconomic status.

Support for Previous Studies

This study was designed without the intent of examining the subgroup of ethnicity. Both School A and School B were similar with regard to the ratio of White to non-White students, with each school being composed of a majority of White students. The result in this study of no significant difference for main effect of instructional design (freshman academy versus traditional high school) was consistent with Barbour (2009)

who found that there was no significant difference in the academic achievement of White students in a freshman academy versus their counterparts in a traditional high school. In addition, Leonard (2011) also found no significant difference in the grade point averages of White students in a freshman academy versus their counterparts in a traditional high school. Barbour (2009) and Leonard (2011) suggested a nonexistent impact on academic achievement of White students in a freshman academy versus their counterparts in a traditional high school. This study supports those findings in that both schools were composed of a majority of White students and the main effect of instructional design was not significant.

Further, the findings of this study were consistent with Styron and Peasant (2010) with regard to the impact of a freshman academy by gender on academic achievement. The researchers found that there was no significant difference in the academic achievement of males and females in a freshman academy versus their counterparts in a traditional high school. Leonard (2011) also found no significant difference in academic achievement of females in a freshman academy versus their counterparts in a traditional high school based on grade point averages. However, upon examination of grade point averages, she found a statistically significant higher grade point average in males who participated in a freshman academy versus their counterparts in a traditional high school. This is discussed later as part of future research considerations.

Generalizations

This study fits within the broader scope of research concerning the impact of freshman academies on academic achievement by suggesting support for previous findings with regard to gender and ethnicity. Conducted in two south-central Arkansas

high schools, it joined the existing body of research conducted in Mississippi (Styron & Peasant, 2010) and Tennessee (Barbour, 2009; Leonard, 2011). In addition, this study expanded the definition of academic achievement to include literacy scores as measured by a standardized assessment. Finally, it expanded the existing body of research by exploring the impact of freshman academies by socioeconomic status on academic achievement.

Using the results of this study to make broader generalizations about the impact of a freshman academy versus a traditional high school on academic achievement should be done after first considering the larger context of the participating schools' profiles as reported by the Arkansas Department of Education (2009). School A had 949 students, grades 9 through 12, with an average class size of 17. There were 220 ninth-graders; 151 of those ninth-graders were study participants. The average years of teaching experience for teachers in School A was 17 years. As reported earlier, School A was composed of a majority of White students (77%) with 33% of students eligible to receive free or reduced-cost lunch. Academically, School A was a high-performing school with 86% of its students scoring Proficient or Advanced on the End-of-Course Algebra I Exam, 70% scoring Proficient or Advanced on the End-of-Course Geometry Exam, 50% scoring Proficient or Advanced on the End-of-Course Biology Exam, and 67% scoring Proficient or Advanced on the End-of-Course Literacy Exam. The average ACT Composite score for School A was 21. Ninth-graders in School A received instruction within a traditional high school instructional design. Teachers who taught ninth-graders were also responsible for teaching additional grade levels. There was no common planning period

for ninth-grade teachers. School A had no advisory period and no mentoring or advisory program in place for ninth-grade students.

School B had 1,212 students, grades nine through 12, with an average class size of 15. There were 275 ninth-graders; 190 of those ninth-graders were study participants. The average years teaching experience for teachers in school B was 11 years. School B was also composed of a majority of White students (92%) with 47% of students eligible to receive free or reduced-cost lunches. Academically, School B was a high performing school with 85% of students scoring Proficient or Advanced on the End-of-Course Algebra I Exam, 92% of students scoring Proficient or Advanced on the End-of-Course Geometry Exam, 55% scoring Proficient or Advanced on the End-of-Course Biology Exam, and 77% scoring Proficient or Advanced on the End-of-Course Literacy Exam. The average ACT Composite score for School B was 22. The 275 ninth-graders in School B received instruction in an established freshman academy. The teachers in core academic areas were assigned to teach ninth-grade only. Ninth-grade teachers of the same content area shared a common planning time. School B had an advisory period in place for mentoring and academic advising purposes.

The review of the school district profiles provided by the Arkansas Department of Education (2009) provides a sound context for further interpretation of the results of this study. First, the finding of no significant difference by the factors of gender or socioeconomic status on mathematics achievement is understood in the larger context that the scores of ninth-graders on the End-of-Course Algebra I Exam for School A and School B were already at a high level score with 86% and 85%, respectively, scoring Proficient or Advanced. In addition, the mean mathematics achievement score of the

randomly sampled study participants from both School A and School B was at or above the value required to be designated as Proficient.

Second, NASSP (2004) suggested that the creation of smaller learning communities led to improved student learning. The average class size of the traditional high school (School A) was 17 students, while the average class size of the freshman academy (School B) was 15 students. This suggests that even though School A was providing instruction to ninth-graders in a traditional high school design, there were still certain attributes of a freshman academy that were inherently present in School A.

Finally, consideration must be given to the specific population of ninth-graders selected for this study. The participants in this study were all ninth-graders from School A and School B who took both the End-of-Course Algebra I Exam and the Arkansas Benchmark Exam for literacy. Because students on an advanced mathematics track in Arkansas take Algebra I in the 8th grade, the mathematics and literacy achievement scores of the top performing mathematics students were not included in this study. In addition, certain students with learning disabilities in literacy are given an alternate assessment. This resulted in the mathematics and literacy achievement scores of lowest performing literacy students also being dropped from the study. Before any broad generalizations are made from this study, researchers should be mindful that by default, this study included only the middle level learners.

Limitations

The implementation of a freshman academy model of instruction varies from institution to institution. Therefore, the results of this study are most relevant to schools that implement models similar to the model presented in this study. A review of literature

revealed a number of freshmen academy models and described the implementation of these models as a continuum from strict implementation to loose implementation of the practices of a freshman academy. Hertzog (2006) proposed there must be no permanent template adopted for implementing a freshman academy. He contended that each class of students is unique and must be treated accordingly in the transition process. The model implemented in this study placed strong emphasis on the following aspects of a freshman academy: (1) mentoring relationships, (2) common planning periods for academy teachers, (3) strong cross-curricular planning, and (4) rigorous, college and career readiness standards for all participants. While these attributes are a common foundation for most freshman academies, institutions failing to implement one or more of these aspects may find the results of this study less relevant.

Another limitation of this study was that the freshman academy model and the traditional high school methods of instruction were studied in two different yet demographically similar school districts in south-central Arkansas. Therefore, the researcher was not able to control for the variable of individual teacher competence in this study. In addition, the overall sampling for the study was very limited in scope with a combined population of 426 students. However, this study did not consist of drastically fewer participants than Styron and Peasant (2010) who studied a combined population of 600 students and Leonard (2011) who studied a combined population of 416 participants. Barbour (2009) conducted a study that consisted of 1,165 participants.

This study was also limited by the very narrow definition of "academic achievement" which included only the Algebra I End-of-Course Exam as a measure of mathematics achievement and the Arkansas Benchmark Exam as a measure of literacy

achievement. Previous studies also used an equally narrow, but different measure of "academic achievement." They included student grade point averages (Barbour 2009; Leonard 2011), and Algebra I and Biology standardized test scores (Styron & Peasant 2010). The results of this study may also be limited by the use of the Algebra I End-of-Course Exam and the Arkansas Benchmark Exam in that these standardized tests had been in place in Arkansas for nearly 10 years and student achievement on these exams may reflect the classroom teachers' abilities to teach students how to succeed on these particular exams rather than the actual impact that instructional design had on student academic performance.

Yet, another significant limitation of this study of the impact of freshman academies on student achievement was the examination of only quantitative measures such as test scores, class sizes, demographics, and other descriptive statistics. This study did not attempt to meticulously explore or identify the impact of the qualitative freshman academy attribute of establishing a meaningful mentoring relationship with students. Though the literature review suggested the positive impact of establishing meaningful relationships, the researcher's exploration of this attribute of the freshman academy was limited to personal observations of both School A and School B.

Holland and Mazzoli (2001) emphasized the importance of creating a culture of learning that was about not only academics but also about relationships. Sims (2010) attributed a student mentoring program to increased student retention, decreased truancy, and fewer behavior and discipline issues. Levin (2005) cited the benefits of an effective mentoring program as an avenue for tutoring, creating a sense of belonging, and making high school less scary. To a certain extent, both School A and School B had various

programs in place that served to meet the social needs of ninth-graders, but only School B had a designated period of the day for advising. School A relied heavily on the ninth-grade counselor to make a visit to the ninth-grade classrooms and explain important academic information about earning graduation credits.

Hattie (2009) suggested that the most important influence on student achievement was the relationship between the teacher and the students. Goodwin (2011) suggested the mentor teacher should create a classroom environment that is warm and empathetic and establishes a sense of community within the classroom where students respect one another. The most noticeable difference in the role of the classroom teacher in School A and School B was that the teacher in School B was required to serve as an academic advisor and mentor for ninth-graders at a designated time of the day. This is not to say that no mentoring relationships were observed in School A; however, there appeared to be no unified effort among ninth-grade teachers to systematically ensure that ninth-graders were part of an organized mentoring program.

Finally, this study is limited to the examination of data as it related to academic achievement. The review of literature suggested that additional results of implementing a freshman academy included improved student attendance, improved student behavior, and increased teacher morale (McIntosh & White, 2006). Chmelynski (2004) noted the decreased number of disciplinary referrals between students in a freshman academy and those not in an academy. This study did not collect or examine any evidence with regard to student behavior, student attendance, or teacher morale.

The implications for this study included the expanded measure of academic achievement to include literacy achievement as measured by a standardized test as well

as the addition of a subgroup based on socioeconomic status. Broader generalizations of the results of this study should be made only after consideration for the larger context of the two schools included in the study as provided by the Arkansas Department of Education School Profiles. Limitations impacting this study included the varying degrees to which an institution implements a freshman academy, the limited scope of sampling from a smaller combined population, the challenges of controlling for the variable of individual teacher competence, and the inability of this study to fully capture the qualitative aspects of a freshman academy. In addition, this study did not collect or examine any data related to student discipline or attendance.

Recommendations

Potential for Practice/Policy

The results of this study may have direct implications on practices and policies of Arkansas high schools with a current grade configuration of grades 9through 12. Schools must examine the current academic performance and social adjustment of current ninth-grade classes to determine if current practices are effective in promoting the successful completion of the transitional ninth-grade year. Because ninth-grade failure rate is a problem facing both Arkansas high schools and high schools nationwide, this study may have implications on educational policies and practices related to fostering success of ninth-graders in at least four different ways.

First, high school leadership should determine and evaluate a variety of indicators of student success beyond standardized test scores. The indicators may include but not be limited to student grade point average, number of student discipline referrals, student attendance record, and student interim grade reports. Development of such a system of

indicators may serve as an effective way for schools to combine the findings of this study with the findings of previous studies. Educational leaders may also consider adopting an indicator of student success that attempts to gauge the qualitative measures alluded to in this study such as student involvement in school activities or student sense of belonging at school. Developing a system of indicators of student success may also help schools determine what attributes of a freshman academy would be the most beneficial for students.

Second, high school leadership should consider implementing a formal ninth-grade mentoring or advisory program in which classroom teachers serve as academic advisors for students. As discussed earlier in this chapter, the uncommon results in this study with regard to the impact of socioeconomic status on academic achievement suggested that the benefits of strong mentoring relationships may supersede the impact of any other aspect of instructional design. Although the impact of mentoring relationships is difficult to quantify, this study suggested that even informal or incidental development of mentor relationship had a positive impact on academic performance.

Third, high school leadership with ninth-grade classes over 300 might consider working to create smaller learning communities of ninth-grade students. This study, along with Styron and Peasant (2010) and Leonard (2011) found no significant difference in the academic achievement of ninth-graders in a freshman academy versus those in a traditional high school. Each of these studies, however, involved the study of ninth-grade classes with fewer than 300 students. Barbour (2009) conducted a study among ninth-grade classes with greater than 300 students and did see differences in student achievement by ethnicity between students in a freshman academy and those in a

traditional high school. The findings of this study, combined with the findings of Barbour (2009), suggests that a ninth-grade class at or greater than 300 students may benefit from the creation of smaller learning communities.

Fourth, high school leadership should further explore the needs of middle level learners and what actions should be taken to help them achieve higher levels of academic performance and success. This study excluded the top performing students and the very low performing students in mathematics and literacy. Findings suggest that schools may want to investigate educational initiatives other than a freshman academy model in order to affect student academic achievement of the middle level learner.

Future Research Considerations

The findings of this study mirrored the inconclusive nature of previous studies discussed in the review of literature. Because the many attributes of a freshman academy are designed to address a variety of challenges faced by ninth-graders during such a pivotal year of high school, further research is needed to provide educational practitioners a better understanding of the impact and effectiveness of freshman academies. The decision to implement a freshman academy should not be based on the results of only one study, rather, on the combined findings of this study, previous studies, and future studies that might include:

1. A replication of this study in two majority-minority high schools to explore the impact of a freshman academy versus a traditional high school on the academic achievement of a largely homogeneous student body of minorities.

2. An examination of the impact of a freshman academy versus a traditional high school on academic achievement as measured by the number of classes a student fails each semester.
3. A qualitative study that examines the relationship between ninth-grader perception of belonging and ninth-grader academic success as measured by grade point averages or by the number of classes a student fails. This study could be done without regard to instructional design.
4. An examination of the relationship between non-academic indicators such as tardiness, disciplinary referrals, and absenteeism in a freshman academy versus those same non-academic indicators in a traditional high school.
5. A comprehensive, large scale study involving participants from across three or more states of the impact of a freshman academy versus a traditional high school on academic achievement as measured by the number of classes a student fails each semester or grade point averages and non-academic indicators such as tardiness, disciplinary referrals, and absentees.
6. A replication of this study using the newly implemented PARCC assessment as an indicator of academic success. This study would eliminate the element of test familiarity and provide a more genuine reflection of student learning in each instructional design.
7. A longitudinal study that examines the impact of a freshman academy versus a traditional high school on student grade point averages and graduation rate.
8. A replication of this study conducted in schools where the majority of students qualified for free or reduced-cost lunches.

In practice, the attributes of a freshman academy are often implemented on a continuum. Though there are a variety of different freshman academy models, SREB identified the following common attributes of successful academy models: (a) a heterogeneous student mix, (b) an instructional facilitator, (c) a common planning time for academy teachers, (d) a student-to-teacher ratio comparable to all other grade levels, and (e) a placement of best teachers in ninth-grade courses. Researchers should be careful to consider to what degree a freshman academy is being implemented and place findings within the larger context of school culture and demographic when possible.

In addition, SREB reported students who were unprepared for high school and failed ninth-grade were far less likely to graduate. SREB also claimed ninth-grade students are failing to connect high school studies to future goals, and schools are failing to provide students with meaningful experiences to promote success. Researchers have the challenge of measuring the impact of a freshman academy on more than just academic success of ninth-graders. For this reason, future research might focus on non-academic indicators such as student disciplinary issues or it can be conducted in a comprehensive manner, which explores both academic and non-academic indicators of student success.

Finally, the results of this study are largely in line with the results of previous studies in suggesting that there is no significant difference by gender in a freshman academy versus a traditional high school on academic achievement. Further, this study found there was no significant difference by socioeconomic status in a freshman academy versus a traditional high school on academic achievement. However, exploration of the larger context of this study revealed that both groups in the study performed well

academically, which suggests that there is more than one pathway or initiative that can lead to academic excellence. Researchers should always explore and consider the impact of other initiatives or professional practices outside the realm of the freshman academy that may be contributing to the academic success of ninth-graders in a particular school.

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APPENDIX

HARDING UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Status of Request for Exemption from IRB Review

(For Board Use Only)

Date: 12/5/13

Proposal Number: 2013-139

Title of Project: The Impact of a Freshman Academy Model Versus a Traditional High School Model on Academic Achievement in Math and Literacy

Principal Investigator(s) and Co-Investigator(s):

■ Research exempted from IRB review.

☐ Research requires IRB review.

☐ More information is needed before a determination can be made. (See attachment.)

I have reviewed the proposal referenced above and have rendered the decision noted above. This study has been found to fall under the following exemption(s):

1 ☐ 2 ■ 3 ☐ 4 ☐ 5 ☐ 6 ☐

In the event that, after this exemption is granted, this research proposal is changed, it may require a review by the full IRB. In such case, a ***Request for Amendment to Approved Research*** form must be completed and submitted.

This exemption is granted for one year from the date of this letter. Renewals will need to be reviewed and granted before expiration.

The IRB reserves the right to observe, review and evaluate this study and its procedures during the course of the study.

Rebecca O. Weaver

Chair
Harding University Institutional Review Board