Student Participation in the Arkansas Better Chance Preschool Program Versus No Participation on Academic Achievement

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STUDENT PARTICIPATION IN THE ARKANSAS BETTER CHANCE PRESCHOOL PROGRAM VERSUS NO PARTICIPATION ON ACADEMIC ACHIEVEMENT

by

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ABSTRACT

by
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Title: Student Participation in the Arkansas Better Chance Preschool Program versus No Participation on Academic Achievement (Under the direction of Dr. Lynette Busceme)

Education is the key to success and is vital for participation in a global society. With access to the internet, students in the United States are competing with students around the world. Providing excellence in education, pre-kindergarten through graduation, is vital to the success of America. To achieve excellence in education, students must have a solid educational foundation. In building this educational foundation, the groundwork must begin with rich early learning experiences in preschool settings.

In 1991, the Arkansas Better Chance (ABC) preschool program was created to help Arkansas students succeed academically by providing them with access to early childhood education services. This study was conducted to gain insight into the longitudinal academic effects of participation in the ABC preschool program within a rural Arkansas setting in Grade 4. Does the benefit of a preschool education diminish as a student progresses through elementary and high school? If the benefits of preschool instruction lessen, at what grade level does this occur?
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CHAPTER I

INTRODUCTION

Education is the key to success and is vital for participation in a global society. With access to the internet, students in the United States are competing with students around the world. However, according to an article in *USA Today*, United States students are trailing behind those in countries such as South Korea, Finland, Singapore, Hong Kong, Shanghai in China, and Canada, which are becoming global leaders in education (Sung-Jun, 2010). According to the 2009 Program for International Student Assessment, the United States ranks 14th in reading, 17th in science, and 25th in mathematics out of 34 countries (Walker, 2010). Arne Duncan, U.S. Education Secretary, stated, “This is an absolute wake-up call for America. The results are extraordinarily challenging to us and we have to deal with the brutal truth. We have to get much more serious about investing in education” (Sung-Jun, 2010, para. 5). Providing excellence in education, pre-kindergarten through graduation, is vital to the success of America.

In the state of Arkansas, we have diligently worked to increase educational standards for our students. According to Lyon (2013), *Arkansas News* has ranked Arkansas fifth in the nation in its annual ranking of states’ educational policies and performance for the second year. This is a tremendous achievement in the education of Arkansas children and clearly shows Arkansans are stepping up to meet the diverse needs
in today’s ever changing technological world to ensure the children in Arkansas are receiving a quality education.

To achieve excellence in education, students must have a solid educational foundation. President Barack Obama is quoted as saying, “I propose working with states to make high-quality preschool available to every child in America . . . Let’s do what works, and make sure none of our children start the race of life already behind. Let’s give our kids that chance” (U.S. Department of Education, 2013). In building this educational foundation, the groundwork must begin with rich early learning experiences in preschool settings.

Cureton (2012) stated a significant milestone in the life of a child is beginning school. She found that students entering kindergarten benefited from attending preschool or in-home teaching. The playing field, so to speak, is not level for all students because some do not have the opportunity for worthwhile learning experiences before beginning formal schooling. Therefore, on the first day of kindergarten, many students are behind. Preschool attendance helps level the playing field for students and may foster student success in elementary school. Arkansans, as well as the Arkansas Department of Education have identified the importance of preparing Arkansas children with the needed prerequisite skills and disposition for learning that will enable students to excel (Arkansas Division of Childcare and Early Childhood Education, 2011b). Children must come to kindergarten with the needed kindergarten readiness skills to succeed.

Where can parents turn to help their students gain these essential kindergarten readiness skills? One way these skills may be taught is through some form of early childhood education by attending a preschool, a head start program, or in-home teaching.
Educating the early childhood learner is vital to the educational success of the student. Hogan (2013) quoted Arkansas Commissioner of Education Tom Kimbrell when he said, “Educating our children is serious business” (p. 1). Widespread access to preschool education of high quality must be available for Arkansas children. Currently in the state of Arkansas, preschool services are available for children who are three, four, and five years old.

For children to succeed academically and to provide students in the state of Arkansas with early childhood education services, the Arkansas Better Chance (ABC) preschool program was created in 1991 (Arkansas Division of Childcare and Early Childhood Education, 2011a). The ABC preschool program provides funding for early intervention programs that serve educationally deprived children, ages birth to eight years old (Arkansas Department of Human Services, 2011). Barnett, Carolan, Fitzgerald, and Squires (2011) acknowledged that initial funding for the ABC preschool program came through a dedicated sales tax, but between 2001 and 2007, the program received funding from an excise tax on packaged beer. The ABC preschool program also receives some federal funding; however, at least 40% of the program’s overall funding must be from local contributions through either cash or in-kind services. Recipients of the program must complete an ABC application. Upon approval of the application, funding is based on criteria specified by the State of Arkansas, 84th General Assembly, Second Extraordinary Session, 2003 in Act 49 of 2003 (Arkansas State Legislature, Pre-K Home, 2003). Act 49 amended the Arkansas Better Chance for School Success to remove the matching requirements, and a limitation on the number of students that a school district serves, based on funding, exists. Schools having 75% or more students scoring below
proficiency level on the benchmark exams (mathematics and literacy) in the preceding two years, schools designated by the Arkansas Department of Education as being in school improvement status, schools located in a school district in academic distress, and other factors including socio-economic status of the service area and the availability of existing quality preschool services in the area are the foundation for the funding. The maximum amount of funding is based upon the projected child enrollment in the program.

**Statement of the Problem**

The purposes of this study were four-fold. First, the purpose of this study was to determine the effects by gender of students participating in an ABC preschool program versus students never participating in preschool on literacy achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination in three Southwest Arkansas school districts. Second, the purpose of this study was to determine the effects by ethnicity of students participating in an ABC preschool program versus students never participating in preschool on literacy achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination for students in three Southwest Arkansas school districts. Third, the purpose of this study was to determine the effects by gender of students participating in an ABC preschool program versus students never participating in preschool on mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination. Fourth, the purpose of the study was to determine the effects by ethnicity of students participating in an ABC preschool program versus students never participating in preschool on mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination.
Background

According to Barnett (2008), early childhood education was not a focus in 1960 because only 10% of the nation’s three and four year olds were enrolled in a preschool program. Early childhood education began with the inception of the Head Start program as part of the war on poverty proclaimed by President Lyndon B. Johnson in January of 1964 during his State of the Union address. In July 1964, congress passed the Economic Opportunity Act, and the Head Start program was born; in addition, a committee was appointed to develop a program to help children overcome the obstacles of poverty (Foster, n.d.). The goal of the Head Start program is to promote school readiness services for children ages birth to five years old. The federally funded program provides low-income families a variety of services, which include education in the form of preschool, nutrition, and medical services (Rock, 2013). Foster (n.d.) noted, “The first Head Start program was an eight-week summer assistance project for low-income children who would enter public school in the fall of 1965” (p. 1). During this time, more than 560,000 children took part in these preschool classes. The students were eligible to receive medical, dental, and mental health services. Knowing the vital need and the importance for preschool services, Congress authorized a fully funded, year-round Head Start program in 1966.

Foster (n.d.) cited that a home-based program was added in 1973, and in 1995, the Early Head Start program was added. The Early Head Start program allowed services for children of low-income families from birth to age three. In 1998, the Head Start program was reauthorized. Both full day and year-round services were added to the program. In 2007, President George W. Bush updated the re-authorization of Head Start to include
services for homeless children. Birch (2011) observed that the Obama administration, through the American Recovery and Reinvestment Act, invested $2.1 billion in Head Start and Early Head Start, expanding these programs to reach an additional 61,000 children and their families.

Educating early childhood learners in Arkansas has roots back to the early 1950s. Two women from Little Rock, Maggie Reynolds and Gay Gattis, saw the need to bring people together who were concerned with the education and welfare of preschool children (Arkansas Early Childhood Association, 2013; Reynolds, 1999). Out of this need, the Arkansas Association on Children under Six organization was created. The organization’s focus was to promote quality care and education for Arkansas preschool children. Because of constitutional age restrictions, the early childhood learner did not have access to public education. The Arkansas Association on Children under Six worked diligently in getting Amendment 53 passed, removing the constitutional barrier of age restrictions for public school education in Arkansas. With the passing of Amendment 53, preschools became a solid avenue for the early childhood learner. The Arkansas Association on Children under Six evolved into what is now known as the Arkansas Early Childhood Association (Arkansas Early Childhood Association, 2013).

Arkansas has seen many changes in the education of the early childhood learner. In 1991, a significant change occurred with the inception of the ABC preschool program. The focus of the ABC preschool program was to offer high quality early education services to children birth to five years old who exhibited developmental and socioeconomic risk factors. Knowing the need for outstanding early childhood education in the state of Arkansas, the Arkansas legislature made a commitment in 2003 to expand
early childhood education funding by $100 million to provide first-class pre-kindergarten services to 3- and 4-year-old children in areas where children were at a high risk for academic failure. The ABC preschool program was expanded and is now known as the Arkansas Better Chance for School Success. This program is identified within the state as Arkansas’ public pre-kindergarten program. In order to address diverse needs of families, different ABC preschool program models serve the children of Arkansas. The ABC preschool program offerings used to serve the children of Arkansas include preschool center-based programs, home visiting programs, Home Instruction for Parents of Preschool Youngsters Program, Parents as Teachers, and Family Child Care Homes (Arkansas Division of Childcare and Early Childhood Education, 2011a). The Arkansas Division of Child Care and Early Childhood Education and the Department of Human Services coordinate to administer the ABC Program.

The ABC preschool program adheres to strict eligibility guidelines. The guidelines require enrolled students to have at least one of the following characteristics:

- family with gross income not exceeding 200% of federal poverty level,
- parent without a high school diploma,
- low birth weight,
- parent under the age of 18 at the birth of the child,
- family with a history of substance abuse/addiction,
- income eligible for Title I Services, eligibility of services under Public Law 99-547,
- family with a history of abuse or neglect,
- a victim of abuse and neglect,
- developmental delays identified through appropriate screening, or limited
  English proficiency (Arkansas Division of Childcare and Early Childhood

In light of these characteristics, Argue and Holland (2013) noted that one of the most
persistent challenges for education is the achievement gap between subgroups of
children. When comparing test scores for children living in different socioeconomic
situations, they said, “children living in more affluent circumstances consistently score
better than children living in poverty” (p. 1). In 2003, providing outstanding education for
all Arkansas students and closing the achievement gap was the focus of both the
Arkansas Commission on Closing the Achievement Gap and Act 33 of the General
Assembly’s Second Extraordinary Session.

The design of the ABC preschool program targets the needs of the educationally
deprived student. Since the educationally deprived student is often a student from an
economically disadvantaged background (Arkansas Department of Education, 2012a), the
ABC Program provides educational services these students would not be able to attain
due to circumstances over which they have no control. The ABC preschool program
services help to narrow the achievement gap, which allows students to have a better
opportunity to succeed in both elementary school and into adulthood. The six core quality
components of the ABC preschool program as described in the Arkansas Department of
Education (2012a) Rules Governing the Arkansas Better Chance Program include (a)
low student to teacher ratio, (b) well-qualified and compensated staff, (c) professional
development, (d) developmental screening and child assessment, (e) proven curricula and
learning process, and (f) meaningful parent and community engagement activities.
The ABC preschool program has stringent regulations regarding the group size within the ABC classrooms (Arkansas Department of Education, 2012a). The group size in any classroom serving ABC students cannot exceed 20 children for ages 3 to 5 years of age, or the classroom’s licensing capacity, whichever is less. The rules also state that the adult to child ratio, for any class that contains ABC students, shall not exceed one teacher to every ten 3- to 5-year-old children.

The ABC teacher must hold a standard Arkansas teacher license and is required to include preschool to fourth grade certification (Arkansas Department of Education, 2012a). The teacher must be proficient and able to demonstrate competency in the areas of developmentally appropriate programming, curriculum development, and daily classroom management. In addition, teachers are required to receive professional development focused on training in Arkansas Framework for Infant and Toddler Care, Pre-K Early Literacy Learning in Arkansas, Math and Science for Young Children, Pre-K Social-Emotional Learning, Work Sampling Online, Child Outcome Planning and Assessment, Deveraux Early Childhood Assessment, Special Education rules and regulations, and Individuals with Disabilities Education Act.

Assessment is vital to determine the level and needs of the early childhood learner (Arkansas Department of Education, 2013b). Therefore, children in the ABC Program are assessed annually. These assessments provide an indication of the child’s progress towards school readiness. Since getting the child ready for kindergarten is of the utmost importance, the assessment identifies the child’s strengths, progress, and needs so weaker areas can be addressed. This is a central part of an effective early childhood program. The
guidelines for the assessment of a child entering the ABC Program require the child to be assessed within 45 days of entering the program.

The routine annual developmental screening will allow the teacher to determine the child’s individual needs as well as any developmental delays or educational deficiencies (Arkansas Department of Education, 2012a). Any child who is identified with developmental delays or educational deficiencies will be referred to the school district’s special education program within seven calendar days of the screening date. The screening includes the areas of vocabulary, visual-motor integration, language and speech development, fine and gross motor skills, social skills and developmental milestones. In addition, within the first 45 days of attendance, the child will receive an age-appropriate health screening, which includes hearing and vision.

Each ABC preschool program is required to have written curriculum plans (Arkansas Department of Education, 2012a). The ABC preschool program curriculum plan must be arranged in thematic units, projects, or topics of study, and include goals and objectives that relate to cultural diversity, social/emotional development, creative/aesthetic learning, cognitive/intellectual learning, physical development and language. The Division of Child Care and Early Childhood Education must approve all curriculum.

As parental and community involvement is also an important component of the ABC preschool program, all ABC Programs must have a plan for parental and community involvement (Arkansas Department of Education, 2012a). The parental involvement plan must allow opportunities for parental input into program operation and design. Parental advice is welcomed and encouraged in the ABC preschool program.
Consequently, the plan must afford parents the right to review programmatic plans. The ABC preschool program has an open door policy for parents and welcomes parental visits as well as participation in classroom activities. Parent-teacher conferences are an essential part of the program, with time provided for two parent-teacher conferences per year. The ABC preschool program welcomes community participation and provides opportunities for members of the community to participate in the educational activities of the classroom. (Arkansas Department of Education, 2012a).

**Early Childhood Education and the ABC Program**

Early childhood education is imperative for school readiness and future student success. Studies have shown that preschool attendance does help with school readiness. Research conducted by Hustedt, Barnett, Jung, and Thomas (2007) of the National Institute for Early Education Research, Rutgers University, identified the benefits for children who have attended an ABC Program. The report, using a rigorous research design, estimated the effects of the ABC Program on beginning kindergarteners’ academic skills. Across the state of Arkansas, 911 children participated in the 2007 study. The educational areas addressed included receptive vocabulary, early literacy, and early mathematics skills.

The result of the study found the ABC preschool program has made a statistically significant and meaningful impact on children’s early language, literacy, and mathematical development (Hustedt et al., 2007). Specific findings of the study concluded students participating in the ABC preschool program had increased vocabulary scores by 5.2 raw score points. A raw score on this measure translates into about the same number of standard score points. The improvement is about 36% of the test’s standard
deviation for the national population; normed standard deviation is 15 points, and was an identifiable 31% growth over the year. Those participating in an ABC preschool program demonstrated an increased vocabulary growth of four months. In the area of mathematics, children participating in an ABC preschool program had score increases of 1.20 raw score points. (One raw score point roughly translates into three standard score points.)

The effect of the ABC preschool program is equivalent to approximately 3.6 standards score points or 24% of the population, normed standard deviation, showing 37% more growth over the year due to the program. In understanding print concepts, children in the ABC preschool program increased their print awareness by nearly 23%. As a result of this program student growth over the year more than doubled. Based on these findings, children who participate in an ABC preschool program before entering kindergarten have the advantage of knowing more letters, more letter-sound associations, and are more familiar with words and book concepts than students who have not attended a preschool program (Hustedt et al., 2007).

**Long-Term Effects of Early Childhood Education**

According to Barnett (2008), there have been dozens of studies examining preschool education’s long-term effect. The findings confirm the significant and lasting effects preschool education has on cognitive abilities, school progress (grade repetition, special education placement, and high school graduation), and social behavior. However, the estimated effects decline as students move from preschool to elementary school, to adolescence, and then to adulthood.

The longitudinal study that set the stage for understanding the impact of early childhood education in shaping the lives of young learners was the Ypsilanti Perry
Preschool Project. David P. Weikart (1970) initiated the Ypsilanti Perry Preschool Project in September of 1962. The study involved 123 disadvantaged minority children. In the study, one group of the children was randomly assigned to a half-day preschool program, while another group of students received no preschool services. Students in the preschool program attended for two years beginning at the age of three (except for a few children who entered at the age of four). Class sizes and student/teacher ratio for the study consisted of 12 or 13 children with two teachers. After two years, the initial effect on language and general cognitive abilities was very impressive: about 0.90 standard deviations between the two groups, which is about the size of the typical black/white score gap.

The landmark High/Scope Perry Preschool Study longitudinal studies (Schweinhart et al., 2005) led the way for the continuation of the study with the Lifetime Effects: The High/Scope Perry Preschool Study through Age 40. Since the 123 project participants were studied from preschool to adulthood, the ability to study nearly the entire original group over time allowed confidence in the long-term findings, which found that the initial cognitive advantage from the preschool program declined over time. The proposed reasoning for this decline is the public school experience allowed the control group to catch up once they entered the kindergarten program. Nevertheless, the enduring benefits of preschool continued throughout the lives of the participants, with evidence of the enduring benefits of high-quality preschool programs for children living in poverty. Exemplary preschool programs contribute to students’ intellectual and social development in childhood and their school success, economic performance, and reduced commission of crime as adults (Schweinhart et al., 2005). The Perry Study was conducted
in eastern Michigan, beginning in the 1960s. Since then longitudinal studies in Arkansas include The Effects of the Arkansas Better Chance Program on Young Children’s School Readiness (Hustedt et al., 2007) and Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung, Barnett, Hustedt, & Francis, 2013).

This study was conducted to gain insight into longitudinal academic effects of participation in the ABC Program within a rural Arkansas setting in Grade 4. It is vital for students to receive a solid foundation in elementary school. Further research is needed to identify the academic effects of preschool over time. Does the benefit of a preschool education diminish as a student progresses through elementary and high school? If the benefits of preschool instruction lessen, at what grade level does this occur?

**Hypotheses**

Based on the preliminary literature review, the researcher generated the following null hypotheses.

1. No significant difference will exist by gender between students participating in an ABC preschool program and students not participating in preschool on literacy achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination in three Southwest Arkansas school districts.

2. No significant difference will exist by ethnicity between students participating in an ABC preschool program and students not participating in preschool on literacy achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination in three Southwest Arkansas school districts.
3. No significant difference will exist by gender between students participating in an ABC preschool program and students not participating in preschool on mathematics achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination in three Southwest Arkansas school districts.

4. No significant difference will exist by ethnicity between students participating in an ABC preschool program and students not participating in preschool on mathematics achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination in three Southwest Arkansas school districts.

**Description of Terms**

**Arkansas Comprehensive Testing, Assessment and Accountability Program.** The Arkansas Comprehensive Testing, Assessment and Accountability Program refers to a comprehensive testing, assessment and accountability system that encompasses high academic standards, professional development, student assessment, and accountability for schools (Arkansas Department of Education, 2013b).

**Arkansas Public School Computer Network (APSCN).** APSCN was established in September 1992 for implementing a statewide computer system linking all Arkansas public school systems and the Arkansas Department of Education as required by Act 4 of 1992 (Arkansas Department of Education, 2013a). The mission of APSCN is to provide all Arkansas public school systems electronic access to administrative computing services that provide state and local decision makers’ accurate, timely and comprehensive information.

**Arkansas Better Chance Program (ABC).** A pre-kindergarten program created by the Arkansas General Assembly in 1991 that offers high quality preschool education
for children birth to 5 years old exhibiting developmental and socioeconomic risk factors (Arkansas Division of Childcare and Early Childhood Education, 2011a). The program is also a funding source for early intervention programs that serve educationally deprived children (Families & Children Together, 2013).

Arkansas Better Chance for School Success. A pre-kindergarten program created by the Arkansas General Assembly, ABC offers high quality preschool education for children 3 or 4 years old exhibiting developmental and socioeconomic risk factors (Arkansas Division of Childcare and Early Childhood Education, 2011a). Unless standards for ABC and Arkansas Better Chance for School Success are listed separately, the term ABC will be used to refer to all participating programs.

Criterion-referenced test. This is the assessment instrument by which student’s learning is scored according to the academic standards in the Arkansas Curriculum Frameworks (Arkansas Department of Education, 2013b). Students are assessed on specific criteria, rather than comparison to other student performances. In Arkansas, the Benchmark Exam is a criterion-referenced test given in Grades 3 through 8.

Department of Human Services. This, Arkansas’ largest state agency, works to ensure citizens are healthy, safe and enjoying a high quality of life. (Arkansas Department of Human Services, 2011).

Division of Child Care and Early Child Care and Early Education. The purpose of the Division, established in Arkansas by Act 1132 of 1997, is to enhance the coordination of child care and early childhood education programs within the state. This coordination ensures a seamless delivery of early childhood and child care services to
low-income families and those who are moving from welfare to work. (Arkansas Department of Human Services, 2011).

**Economically disadvantaged.** This is a status indicating a student is eligible for free or reduced priced meals under the National School Lunch and Child Nutrition Program (Newton, 2013).

**Head Start Program.** This federally funded program targets children ages 3 to 5 years old and provides a variety of services, including education in the form of preschool, as well as, nutrition and medical services (Rock, 2013).

**Grade 4 Augmented Benchmark Examination.** This exam includes criterion-reference subtests focused on measuring student performance on items specifically developed by Arkansas teachers and the Arkansas Department of Education that are aligned with the Arkansas Mathematics and English Language Arts Curriculum Frameworks. Current law and the State Board of Education regulations require the administration of criterion-referenced tests, and all students are expected to participate (Arkansas Department of Education, 2013b).

**Preschool.** This term describes a center-based program that provides educational experiences for children during the year or years preceding kindergarten (Espinosa, 2002; Preschool, 2014).

**Scale score.** Scale Scores are transformed raw scores. For every possible raw score on a test form, there is a corresponding scale score, although a scale score may represent more than one raw score depending on the distribution of the results. When multiple forms of a test are used, or when the results are compared from year to year, scale scores are needed to adjust for possible differences in test form length or difficulty.
Scale scores provide a useful measurement tool for many assessment programs (Arkansas Department of Education, 2013b).

**Significance**

**Research Gaps**

High quality preschool programs are essential for the early childhood learner. Additional research is vital to recognize achievement gaps in mathematics and literacy of students who have not attended a preschool program and to reinforce the need for preschool services for all children. The study will aid in determining long-range effects, if any, on literacy and mathematics achievement based on gender and ethnicity for fourth grade students in rural Arkansas who have attended an ABC preschool program versus students who have not attended preschool.

**Possible Implications for Practice**

The goal of this study was to evaluate the effectiveness of the ABC Program in three Southwest Arkansas school districts. The results from the research were used to determine whether students who attended an ABC preschool program performed at a higher level of achievement in the areas of literacy and mathematics based on gender and ethnicity than students who have not attended preschool. The results will help teachers and administrators in determining the intervention needs of students who attended an ABC preschool program and students with no preschool attendance. Preschool services provide many opportunities for the early childhood learner. Information from the study could provide educators with data needed to improve existing pre-kindergarten programs.
Process to Accomplish

Design

A quantitative, causal-comparative strategy was used in this study. In the first and third hypotheses, a 2 x 2 factorial between-groups design was used. The independent variables for these two hypotheses were gender (male versus female) and preschool participation (ABC preschool program versus no preschool). The dependent variables were literacy and mathematics achievement measured by the Arkansas Benchmark Exam for fourth grade, respectively. In the second and fourth hypotheses, a 2 x 2 factorial between-groups design was used. The independent variables were ethnicity (White, non-White) and preschool participation (ABC preschool program versus no preschool). The dependent variables were literacy and mathematics achievement measured by the Arkansas Grade 4 Augmented Benchmark Examination, respectively.

Sample

The study used the scores of fourth grade students, identified as attending preschool by the APSCN, who took the Grade 4 Augmented Benchmark Examination in three Southwest Arkansas rural elementary schools. The three schools were chosen based on their similar demographics and grade configurations. Both male and female students and White and non-White students were included equally within the sample. Students receiving special education services were excluded from the study. The sample was randomly chosen using an on-line Research Randomizer (Urbaniak & Plous, 2013).

Instrumentation

In the spring of 2013, fourth grade students were tested on the Grade 4 Arkansas Augmented Benchmark Exam in both literacy and mathematics. The Grade 4 Augmented
Benchmark Examinations include the criterion-referenced test component, which focuses on measuring student performance on items specifically developed by Arkansas teachers and the Arkansas Department of Education that align with the Arkansas Curriculum Frameworks for Mathematics and English Language Arts. The norm reference testing component focuses on rank-ordering student performance based on national norms and contains items in the subsections of reading comprehension, mathematics problem solving, and language (Arkansas Department of Education, 2013b). Measurement levels used to assess the exam in both literacy and mathematics were scale scores based on the proficiency levels of advanced, proficient, basic, and below basic.

**Data Analysis**

To address the first hypothesis, a 2 x 2 factorial analysis of variance (ANOVA) was conducted using preschool attendance, as identified by APSCN, by gender as the independent variable, and the overall literacy achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. The second hypothesis was analyzed by a 2 x 2 factorial ANOVA with preschool attendance, as identified by APSCN, by ethnicity as the independent variable, and the overall literacy achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. Hypothesis 3 was examined by a 2 x 2 factorial ANOVA using preschool attendance, as identified by APSCN, by gender as the independent variable, and mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. The researcher conducted a 2 x 2 factorial ANOVA to test the fourth hypothesis with preschool attendance, as identified by APSCN, by ethnicity as the independent variable, and the
overall mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable.
CHAPTER II

REVIEW OF THE RELATED LITERATURE

Preschool attendance lays the foundation to help children succeed academically and in life. Children entering kindergarten need to be prepared and possess the needed kindergarten readiness skills to be successful. To test this belief, Gorey (2001) conducted a meta-analysis on the short-term and long-term effects of preschool, finding that while short-term effects are impressive, long-term effects are less so. Another group of researchers, Aos, Lieb, Mayfield, Miller, and Penucci (2004) conducted a meta-analysis of the long-term effects of early childhood interventions and found similar results. Barnett (2006) assimilated research results and concluded that the key is a well-designed preschool program. He implied that a well-designed program is standards-based, funded, and overseen by federal and/or state entities. This is perhaps the key to producing long-term improvements in multiple measures of school success. In order to explore the foundations of a well-designed preschool system, this chapter provides a brief overview of the history of early childhood education, early childhood education studies, Arkansas Early Education Programs, and characteristics of quality preschool programs, concluding with the ABC studies.

History of Early Childhood Education

Early childhood education has a strong philosophical foundation. Philosophers who developed thought regarding early childhood education extend as far back as Plato
and Aristotle, and include John Amos Comenius, John Locke, Jean Jacques Rousseau, Johann Pestalozzi, and Jean Piaget. These philosophers enlightened the world concerning the need for early childhood education. To further the theories of these philosophers, early childhood curriculum and methodology were needed. Educators Friedrich Froebel, John Dewey, and Maria Montessori were influential in the development of programs for the early childhood learner. Together, both philosophers and educational researchers perceived a need to attend to the education of the early childhood learner.

**Philosophical Foundations**

Philosophers from Plato to Jean Piaget sought to understand and explain theories of education. In their quest for knowledge, these philosophers emphasized the need for educated citizens, asserting that educated citizens are more competent to face and solve the challenges of life (Brumbaugh & Lawrence, 1963).

**Ancient educational theories.** The ancient Greek philosopher, Plato, promoted education for a perfect society. Plato was one of the earliest of the educator-philosophers to recognize the importance of the early childhood years. He believed the early childhood years were a time when a child’s predispositions or attitudes were formed (Brumbaugh & Lawrence, 1963).

Aristotle is considered the founder of realism. Like Plato, he recognized the importance of early childhood as a time of human development. He believed the education of the early childhood learner “is a time of games which should be mimicries of future earnest, a time of tales and stories, which should be foreshadowing of future knowledge” (Barker, 1959, p. 431). According to Aristotle, the education of children before age 5 should be a time where no lesson or tasks are imposed upon the child.
Educational principles from the 17th century. John Amos Comenius, 17th century philosopher, is known as the Father of Modern Education. He was a pansophist educator and proponent of international education. *Pansophism* (n.d.) is defined by Merriam-Webster’s online dictionary as “one claiming or pretending to universal knowledge” (para. 1). Comenius believed that this knowledge would lead the knower to God, the source of all truth and goodness (Capkova, 1996). He developed important insights into child nature, psychology, and development that he applied to his classroom instruction.

From his observations of nature, Comenius developed the following four principles that could be applied to education: (a) nature has set an appropriate time for growth and development, (b) natural operations are orderly and sequential, (c) nature proceeds gradually, and (d) nature, moving to an end, completes whatever it begins (Capkova, 1996). Comenius thought one should not force children to learn. Rather, since his understanding of childhood, like the human life cycle, included stages of development, he believed that children would learn when their bodies and minds were ready. In teaching children, he believed the lesson taught should be appropriate to the child’s readiness and ability to learn as determined by the particular developmental stage. Comenius believed the first 6 years of a child’s life were crucial for the child’s later development. He is credited with writing the first picture book for children, *Orbis Sensualium Pictus*.

John Locke was an English doctor and philosopher during the late 17th century. Locke’s educational philosophy was that children were born with a blank slate and that their experiences would determine what they would become (Axtell & Locke, 1968). In
helping children to become what they would be, he thought it was important to take great care in the education of the young.

In education, Locke did not like the authoritarian approach; he favored methods that would help children understand the difference between right and wrong to cultivate a moral sense of their own. Therefore, Locke believed it was important to teach practical knowledge. In teaching, he believed children learned best when they were engaged in the subject matter. In their engagement of the subject, Locke believed that during the course of study children should be allowed some self-direction, should have the ability to pursue their interests, and that education should be pleasant (Connolly, 2014). Locke’s views greatly influenced American education.

**Educational beliefs from the 18th and 19th century.** Jean Jacques Rousseau, an 18th century French philosopher, held the essential belief that education should be carried out, as much as possible, in harmony with the development of the child’s natural capacities by a process of autonomous discovery (Bertram, 2011). He claimed children are born innately good and their natural tendencies should be protected from the corrupting influences of society. Therefore, children should be isolated from the domineering will of others. His views of education and the hands-on approach in education have made a difference in the education of the early childhood learner.

During the late 18th century and early 19th century, Johann Heinrich Pestalozzi was a writer, political and social reformer, and prominent educator. Historians state that his “first dream, which lasted until his death, was to comfort and regenerate mankind, especially the poor, by instruction and education” (Compayre’, 1907, p. 16). Pestalozzi’s educational passion was for the education of the early childhood learner.
believed education and instruction should be enjoyable; if it were fun, children would want to be engaged in learning. He is quoted as saying, “All instruction would not be worth a farthing if it necessitates the loss of a child’s courage and gayety” (Compayre’, 1907, p. 17). Pestalozzi believed that children should laugh, and that laughter is a gift from God.

Educational theories from the 20th century. Jean Piaget, an influential psychological researcher throughout most of the 20th century who studied how children think, developed the Theory of Cognitive Development that still resonates today (Voyat, 1982). According to Huitt and Hummel (2003), “There are two major aspects to [Piaget’s] theory: the process of coming to know, and the stages we move through as we gradually acquire this ability” (para. 1). In the process of cognitive development, Piaget identified four stages: (a) the sensorimotor stage, which occurs in infancy; (b) the pre-operational stage, which develops during the toddler and early childhood years; (c) the concrete operational stage, which occurs in the elementary grades and early adolescence, and (d) the formal operational stage, which takes place in adolescence and adulthood (Huitt & Hummel, 2003).

Because of Piaget’s outstanding work, many preschool and primary programs today still utilize his theory, which focused on allowing children the opportunity of discovery learning, while supporting the developmental interests of the child (Huitt & Hummel, 2003). In doing this, parents and teachers are to challenge the child’s abilities without presenting material or information that is too advanced or beyond the scope of the child’s level. In instruction, the use of manipulatives, peer reflection, and field trips
are encouraged, allowing students the opportunity for a concrete, hands-on approach to learning.

The philosophical stances of all of these men, from Plato to Piaget, both directly and indirectly impacted the thinking of those whose work it was to develop well-designed early childhood programs. Those programs have been established based on the philosophical stance that early childhood education is not only important, but that it is also accompanied by a set of developmentally appropriate activities. The major contributors to the systems and structures of early childhood education are discussed in the following section.

**Curriculum and Methodology**

With the foundation laid by philosophers, educators worked to find the best programs to educate students. Though there are many talented educators who have helped bring philosophers’ ideas to life throughout the decades, three individuals stand out as having had international impact on the methodology of early childhood education: Friedrich Froebel, John Dewey, and Maria Montessori. These pioneers led in developing appropriate education for the early childhood learner.

**Friedrich Froebel.** In 1837, Froebel changed the way we think about early childhood education when he established the first kindergarten in Blankenburgh, Germany (Cole, 1931). Since he believed nature and a child’s mental development were connected, in Froebel’s kindergarten, children could develop freely and naturally. His program stressed the importance of play where children could express their inner feelings. In Froebel’s book, *The Educated Man*, he stated, “Education in instruction and training, originally and in its first principles, should necessarily be passive, following
(only guarding and protecting), not prescriptive, categorical, or interfering” (Froebel, 1895, p. 7). Froebel believed children were not just miniature adults, but that children had a right to be children. He also understood that children develop at different stages and at different times. Through his kindergarten program, Froebel developed unique kindergarten materials he called gifts and occupations. The gifts allowed the child to develop universal aspects of the external world at the level of the child’s development. The gifts have been identified as the first educational toys and were objects he believed had a special symbolic potential. The occupations were raw materials students could use in their drawing and building activities that allowed them to concretize their ideas (Froebel, 1895).

In his continued commitment to the early childhood learner, Froebel established a nursery school for 3- and 4-year-old children. He wrote nursery rhymes and songs for his students and devised physical exercise, activities, and games for use in the nursery schools (Froebel, 1895). Fittingly, Friedrich Froebel, who devoted his life to the development of a system of education for young children, became known as the Father of Kindergarten (Weston, 2000).

**John Dewey.** John Dewey was the first major influence on American early education. Dewey believed children were of great value and that childhood was an important part of their lives. He thought educational programs for children should be child-centered, involve real-life experiences, and be set up so children were allowed to make choices (Martin, 2002). Dewey’s principles are still used today in nursery schools that place an emphasis on play and parent education. John Dewey made a significant
impact on the American education system and is known as the Father of Progressive Education (Berube, 1993).

**Maria Montessori.** Maria Montessori was the first female physician in Italy. During her last two years in medical school, she studied pediatrics at the Children’s Pediatric Hospital. This experience guided her to move in the direction of a career in early childhood education (Kramer, 1988). In 1907, she established the *Casa dei Bambini*, a school located in a slum area in Rome. The children of *Casa dei Bambini* came from the lowest strata of society. Their fathers were not workmen with regular employment; instead, they were casual workers who sought temporary work and were largely illiterate (Montessori, 1963). The basic principles at the *Casa dei Bambini* focused on children’s maximum development. Montessori described in her book, *The Absorbent Mind*, that the most effective learning takes place in a structured and orderly environment (Montessori, 1949). She believed a child would learn best if the environment was child-size and met the needs of the student. The tables, chairs, and apparatus in the Montessori school were fitted to the needs of the students. The classrooms were also designed to allow children the freedom of movement (Kramer, 1988).

The directress, or leader, in the Montessori schools was very different from that of a teacher in a traditional school. Rather than teach set standards, the directress was to guide students in their self-development. The curriculum at the *Casa dei Bambina* focused on developing competencies in the three broad areas of practical life skills, in motor and sensory training, and in the more formal literacy and computational skills and subjects (Montessori, 1912). Montessori, an educational pioneer, and her methods of
Throughout the centuries, philosophers and educators have understood the need for educating the early childhood learner. As the development of an education program for the early childhood learner continued to grow, so did the need for a structure to educate the early childhood learner. To meet this need, nursery schools, imagined during the days of Plato, would come into existence.

**Nursery Schools**

With the emergence of the Industrial Revolution, the world was changing. Mothers were turning to the workforce; children were being left at home unsupervised, and at times, even locked in the home. Because of the lack of supervised care, some of the children died. Care for young children of working mothers was needed. Two women, Margaret McMillan and her sister Rachel McMillan, were social reformers in England. Seeing the need for the care of the early childhood learner, they established an Open-air Nursery School and Training Centre in 1911. The McMillan sisters called their program a Nursery School. In the school, they demonstrated their care and concern for the early childhood learner through nurturing as well as learning (Curtis, 2002). The program at the Nursery School emphasized the value of active outdoor work and play, and the curriculum stressed health and nutrition, perceptual-motor skills, and the development of imagination. The teacher’s role was both to nurture and to informally teach children using a well-planned environment (Peltzman, 1998).

In the United States, nursery schools were directly influenced by the English nursery school as well as both Freudian theory and Dewey’s ideas on education. Caroline
Pratt opened The City and Country School, one of the first nursery schools in the United States, in 1914 in New York City (Lascarides & Hinitz, 2000). Just two years later in 1916, the Bureau of Educational Experiments opened a laboratory nursery school. The school was operated under the direction of Harriet Johnson (Feeney, Christensen, & Moravcik, 1991). According to Morgan (1999), a number of other laboratory nursery schools were established in America. These included the Laboratory Nursery School at Columbia University Teachers College, organized by Patty Smith Hill; the Ruggles Street Nursery School in 1922, and the Training Center in 1924 (Morgan, 1999). Nursery schools that were established in many college home economics departments to train future homemakers served as centers for child development research during the 1920s and 1930s (Morgan, 1999).

To help aid the nursery school movement, the National Committee on Nursery Schools was formed by Patty Hill at Columbia University’s Teachers College in 1926. The organization’s name was later changed to the National Association for Nursery Education and is currently called the National Association for the Education of Young Children (Morgan, 1999). The National Association for the Education of Young Children is the nation’s leading voice for high-quality early childhood education for children from birth through age 8 and has made an impact on the education of the early childhood learner (National Association for the Education of Young Children, 2014).

Many philosophers and educational researchers have worked to make a difference in the education of the early childhood learner. Although their work in the field of education brought to light the importance of education and the need for children to be
educated, further research was needed to improve education for the early childhood learner.

**Early Childhood Education Studies**

Educators and researchers alike have meticulously worked to study the educational advancement of the early childhood learner. Educators and researchers David P. Weikart, Frank Porter Graham, and Lorraine M. Sullivan were influential in research advocating the importance of early childhood education. Their studies, the Perry Preschool Study, the Carolina Abecedarian Project, and the Chicago Child-Parent Center Program, will be discussed.

**Perry Preschool Study**

The Perry Preschool study took place in Ypsilanti (Michigan) Public Schools in the Perry Elementary School under the direction of David Weikart. The study was conducted from 1962 to 1967 and is the most well-known of the High Scope research studies: studies that use rigorous, long-term research to document the powerful, positive effects of childhood learning on later life (HighScope, 2015).

The Perry Preschool study used an experimental design examining the lives of 123 children who were born into poverty and were at a high risk of failing in school (Weikart, 1970). In the implementation of the study, students in the preschool who were 3 and 4 years of age were randomly selected and then divided into a program group that received a high-quality preschool program and a comparison group who received no preschool services. The Perry Preschool program group utilized four teachers; the teachers were highly qualified and held bachelor’s degrees. The four teachers had a daily class of 20 to 25 students and also made weekly home visits. Jean Piaget’s educational
model was used, allowing children to participate in their education by planning, doing, and reviewing their activities (Weikart, 1970). Students in the program were annually evaluated and data was collected up to the age of 11 and then again at ages 14, 15, 19, 27, and 40. In comparing the Perry Preschool program group to the no-program group, there were major findings in the areas of percentage of students ready for school at the age of 5, students committed to school at age 14, basic achievement at age 14, high school graduates, earnings, arrests, better health and family relations, and better cost analysis (Schweinhart et al., 2005). An overview of these results follows.

First, being ready for kindergarten and having the needed prerequisite skills to succeed are vital for the success of the early childhood learner. Students must be prepared with the needed kindergarten “readiness” skills to succeed (Schweinhart et al., 2005). For the study, the percentage of students in the Perry Preschool program group who were ready for school was 67%, whereas the no-program group was 28%. Next, instilling a good educational foundation often gives students a more serious commitment to school. The percentage of students in the Perry Preschool program group who were committed to school at age 14 was 61%; in the no-program group, this percentage was 38%. This constitutes a significant difference in students who were committed to school and students who were not (Schweinhart et al., 2005). Knowing the importance of education early on seems to give students the commitment needed to succeed.

Other aspects observed, student achievement and student success, are important factors in the education of students. Students in the program group had higher basic achievement at the age of 14 compared to students in the no-program group, with a comparison of 49% to 15% (Schweinhart et al., 2005). Education thrives when students
achieve and succeed, and there was clearly substantial difference between the Perry Preschool program group and the no-program group. In addition, graduation, another milestone in the life of a student and marker of success, was yet another area where the Perry Preschool program group outscored the no-program group; 77% of the program group graduated from high school, and 9% graduated with an associates’ degree or higher. In contrast, only 60% of the no-program group graduated from high school, and only 5% continued their education and graduated with an associates' degree or higher (Schweinhart et al., 2005).

Continuing the positive trend, more of the Perry Preschool program students were employed at age 40 than the no-program group: 76% of the Perry Preschool group was employed, and 62% of the no program group was employed. The percentage of Perry Preschool program students who made $20,000 or more at age 40 was 60%; for the no-program group, it was 40% (Schweinhart et al., 2005). Furthermore, crime was another area where the Perry Preschool program percentages were far better than the no-program percentages. By the age of 40, only 36% of the Perry Preschool program group had been arrested five or more times; the no-program group had 55% of their students arrested five or more times. In the areas of violence, drugs, and property crimes, the Perry Preschool program students were also less likely than the no-program group to be arrested for violent crimes, 33% to 48%; drug crimes, 14% to 34%; and property crimes, 36% to 58% (Schweinhart et al., 2005).

The Perry Preschool program students also performed better as parents and had better family relationship than students had in the no-program group (Schweinhart et al., 2005). Male students in the Perry Preschool program who had an active role in raising
their own child were 57%, versus 30% for male students in the no-program group. The percentage of male students in the Perry Preschool program who abused prescription drugs was much lower, at 17%, than the no-program group at 43%. Perry Preschool program students were also less likely to abuse marijuana, with 48% using it, whereas 75% of the no-program group had abused marijuana. Finally, the Perry Preschool program students were less likely to lose a week of work for health problems, at 43%, compared to the no-program group, at 55% (Schweinhart et al., 2005).

**Carolina Abecedarian Project**

The Carolina Abecedarian Project was a carefully controlled scientific study of the potential benefits of early childhood education for poor children. The Project began in 1972 in Chapel Hill, North Carolina, at the Frank Porter Graham Center and was completed in 1977 (Ramey et al., 1984). Throughout the span of the Project, four different groups of students participated, with a total of 57 students in the intervention group and 54 students assigned to a control group. However, four children withdrew early from the study, leaving 107 children in the initial analysis sample (Promising Practices Network, 2011). The study provided educational childcare and high-quality preschool from infancy to 5 years old. In the Project, each child received an individualized prescription of educational activities. The educational activities consisted of specially designed games incorporated into the child’s day, emphasizing the areas of social, emotional, and cognitive areas of the child’s development, with a particular focus placed on language (Frank Porter Graham Child Development Institute, 2014).

The Project’s day care center operated from 7:45 a.m. to 5:30 p.m., 5 days per week, 50 weeks per year (Promising Practices Network, 2011). If transportation was
needed, it was provided. Infants and children up to walking age were cared for in a nursery area; toddlers and preschoolers were grouped in other areas according to their age and developmental levels. Families were encouraged to participate in parent group sessions on topics relating to parenting and family development. If needed, social workers were available to provide assistance to parents, and pediatric care was provided by a team of on-site research nurses and pediatricians (Promising Practices Network, 2011). The staff for the Project included a director, 12 teachers and aids, and an administrative staff member. Teacher-child ratio began at one-to-three in the nursery and gradually increased to one-to-six in the last preschool year. Professional development and technical assistance training were provided to all the educational staff. Regarding the professional backgrounds of the staff, it varied, from those with graduate degrees in early childhood education to paraprofessionals; however, all of the teaching staff had extensive experience in working with young children. In addition, teachers for the school-age group were graduate-level teachers with backgrounds in primary education. These primary education teachers worked with approximately 12 children each per year (Promising Practices Network, 2011).

There were several major findings of the Carolina Abecedarian Project (2014). One area involved cognitive test scores. Participants in the program had higher cognitive test scores from the toddler years to age 21. Students in the program also had higher achievement in both reading and mathematics from the primary grades through young adulthood, completed more years of education, and were more likely to attend a 4-year college.
Chicago Child-Parent Center Program

Another study that focused research on the education of the early childhood learner was the Child-Parent Center Program (Waisman Center, 2014). The Child-Parent Center program, with roots dating back to 1966, was designed to serve families in high-poverty neighborhoods that were not being served by the Head Start program or any other early childhood programs. The development of the program began when Benjamin Willis, The General Superintendent of the Chicago Public Schools, asked Lorraine M. Sullivan, the Superintendent of District Eight, to report on ways to improve student attendance and achievement in her district. In the development of her report, Sullivan emphasized these four key elements for building academic success: parent involvement in the early years of school, instructional approaches designed to develop speaking and listening skills and tailored to children’s learning styles, small class sizes to provide for individual attention, and attention to health and nutritional services (Waisman Center, 2014).

The Child-Parent Center program opened in May of 1967 and was implemented at four sites (Naisbitt, 1968). The sites were in close proximity to a feeder elementary school; however, due to a lack of available space in the schools, the centers began as mobile units. The mobile units had six rooms that consisted of four classrooms, a parent room, and an administrative office. Student enrollment at each center was 120 students and included a half-day preschool and kindergarten program for 40 weeks, as well as an 8-week summer program (Naisbitt, 1968). Each Child-Parent Center program school had a principal, and the principal was given the flexibility to hire his staff and to develop his or her own unique instructional approaches. In the development of the curricula and
material for their schools, the principals researched many programs, including the High
Scope Perry Preschool Program, The Bereiter-Engleman Program, The Bank Street
Program, The Gotkin Language Lotto, and several home-based parenting programs.

The major finding of the Child-Parent Center program was that its participants
scored at or above the national average in language and mathematics tests in kindergarten
(Waisman Center, 2014). The majority of participants scored in the range of ready for
first grade on the Metropolitan Readiness Test, and children who stayed in the Child-
Parent Center in first to third grades were able to maintain their level of performance in
comparison to the national average and increase their performance advantage relative to
Chicago students. Post-kindergarten academic performance was also reported for students
who remained in the program. Students in fourth and fifth grade with extensive Child-
Parent Center program participation had scores substantially higher than the average of
their Chicago peers and Title I students. However, on the national level, participants in
Child-Parent Center scores were on average 6 to 8 months lower than the national
average (Waisman Center, 2014).

The Child-Parent Center program, second only to the Head Start program in being
the oldest federally funded preschool in the United States, was successful in that children
who participated for 1 or 2 years in the Child-Parent Center preschool had higher reading
and mathematics achievement test scores and lower rates of grade retention and special
education placement up to age 12 (Waisman, 2014). Like the other two preschool studies
mentioned, the Child-Parent Center program had a positive impact on the education of
the early childhood learner, both initially and in the years after students left the program.
Arkansas Early Education Programs

As the previous studies have shown, preschool education seems to be foundational in preparing the early childhood learner. Arkansans, identifying this need, have worked to ensure success of the education for the early childhood learner. Tony Wood, the Commissioner for the Arkansas Department of Education (2014), stated, “We stand committed to providing a quality public school education to ensure all Arkansas students are ready for college and careers” (para. 1). To prepare students to be ready for college and careers, research supports the importance of laying a solid educational foundation in the form of early childhood education. In doing this, Arkansans have striven to meet the needs of the early childhood learner by implementing programs such as the Arkansas Head Start program, the ABC preschool program, and district-funded, tuition-supplemented preschools. These three programs will be analyzed based on funding sources, accountability systems, required staff credentials, and instructional programming. The fourth preschool offering in the state, privately-funded preschools, is not discussed due to the lack of standardization and accountability to a federal or state entity.

Head Start

Head Start was designed as part of President Lyndon B. Johnson’s War on Poverty. Implementation of this federal program began in 1964 as a way to promote school readiness and help break the cycle of poverty (Arkansas Head Start, 2014). To be eligible for the Head Start program, children must be 3 to 5 years old and from families who are low-income. The program supports children’s cognitive, social, and emotional development in a learning environment that encourages growth in many areas such as
language, literacy, and social and emotional development. Since parents are a child’s first teacher, the Arkansas Head Start program encourages the role of the parent in the education of their children (Arkansas Head Start, 2014).

Head Start has been adapted and extended throughout the years. Initially, the Office of Economic Opportunity launched an 8-week Project Head Start program in the summers of 1965 and 1966 (Arkansas Head Start, 2014). Changes were made to Head Start in 1969 when the program was transferred from the Office of Economic Opportunity to the Office of Child Development in the United States Department of Health, Education, and Welfare. The Carter Administration broadened Head Start’s services by providing a bilingual and bicultural program in about 21 states. In 1984, during the Reagan administration, Head Start’s grant budget exceeded $1 billion. Early Head Start grants were administered during the Clinton administration, and in 1998, Head Start was reauthorized to provide full day and full year services. Head Start was reauthorized again in 2007 under the George W. Bush administration with several provisions aligned to strengthen the quality of the program. According to sources, these changes included

…alignment of Head Start school readiness goals with state early learning standards, higher qualifications for the Head Start teaching workforce, State Advisory Councils on Early Care and Education in every state, and increased program monitoring, including a review of child outcomes and annual financial audits. (Head Start, 2014, p. 1)

In 2009, the American Reinvestment and Recovery Act added more than 64,000 openings for Early Head Start and Head Start programs (Head Start, 2014).
**District-Funded, Tuition-Supported Preschool**

Head Start is one venue for the education of the early childhood learner. However, when space is not available in the Head Start or ABC preschool programs, or these programs not offered, other alternatives must be sought. District-funded, tuition-supported preschool is another avenue to provide early childhood education services. These additional education services to the children of Arkansas were established when Act 1132 of 1997 was passed. Act 1132 of 1997 created the Division of Child Care and Early Childhood Education (Arkansas Department of Human Services, 2011). The Division of Child Care and Early Child Care and Early Education works within the Arkansas Department of Human Services to enhance the coordination of childcare and early childhood education programs within the state of Arkansas. The mission statement of the Division of Child Care and Early Child Care and Early Education, working with the Arkansas Early Childhood Commission, proclaims,

> As good stewards of the public trust, the Early Childhood Commission will support and advise the Division by ensuring that all Arkansas children and families have access to a safe, high-quality, developmentally appropriate, nurturing learning environment and by educating and assisting parents, child care providers, and communities to prepare our children for future success. (Arkansas Department of Human Services, 2011, para. 1)

The Division of Child Care and Early Child Care and Early Education, working through the licensing and accreditation unit, ensures that childcare facilities meet the minimum licensing requirements. Arkansas public school preschool programs must meet these standards in order to provide preschool services.
Arkansas Better Chance Preschool Program

Arkansans looking for ways to ensure the education of the early childhood learner implemented the ABC preschool program in 1991 and later expanded it to the Arkansas Better Chance for School Success (Arkansas Division of Childcare and Early Childhood Education, 2014). The ABC preschool program is identified as the state of Arkansas’s public pre-kindergarten program. According to the Arkansas Division of Childcare and Early Childhood Education, the ABC preschool program offers a variety of programs, which includes a preschool center-based program, a home visiting program, Home Instruction for Parents of Preschool Youngsters Program, Parents as Teachers, and Family Child Care Homes (Arkansas Division of Childcare and Early childhood Education, 2011c). According to the ABC Fast Facts provided by the Arkansas Department of Human Services, in 2011, the ABC preschool program served 25,476 children in 133 school districts, 13 educational cooperatives, and 129 private providers (Arkansas Department of Human Services, 2011).

The funding for the ABC preschool program is through an appropriation in the ADE Public School Fund budget (Arkansas Department of Human Services, 2011). To administer the program, ADE contracts with the Department of Human Services, Division of Child Care and Early Childhood Education. The Division of Child Care and Early Child Care and Early Education is responsible for all operational duties associated with the ABC preschool program and is governed by the Arkansas State Board of Education, who is the final authority for approval of rules and grants. The Division of Child Care and Early Child Care and Early Education provides the State Board of
Education regular reports and updates and gives annual reports to the Joint Legislative Committee on Education.

**Characteristics of Quality Preschool Programs**

To ensure a quality preschool, it is important to look at the program characteristics such as staff qualifications, ongoing staff training, curriculum, and parental involvement. Three preschool programs identified as providers of early childhood education in Arkansas include the Head Start program, district-funded preschool, and the ABC preschool program. Following is an analysis of each based on the program requirements, teacher qualifications, staff training, curriculum, and parental involvement.

**Program Requirements**

The Head Start classroom is a center-based program whose one teacher must demonstrate competency in planning, implement learning experiences to advance the intellectual and physical development of children, and establish and maintain a safe, healthy learning environment (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). In addition, the teacher must support the social and emotional development of children and encourage parental involvement.

Next, each district-funded preschool program has to have a director, an assistant director, or a site supervisor who is responsible for administering, planning, managing, and controlling the daily activities of the center (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). The director must also make sure the faculty meets licensing requirements, ensure the health and safety of the children, and provide prudent supervision of all staff and volunteers. Finally, the ABC
preschool program can have a coordinator or site director who does not have teaching responsibilities. However, he or she must meet the licensing requirements for a center director, complete the director’s orientation, and preferably have experience in early childhood education.

**Teacher Qualifications**

As of October 1, 2011, Head Start teachers must possess one of the following qualifications: (a) an associate’s, bachelor’s, or advanced degree in early childhood education; (b) an associate’s degree in a field related to early childhood education; (c) a bachelor’s or advanced degree in any field and coursework equivalent to a major relating to early childhood education, with experience teaching preschool-age children; or (d) a bachelor’s degree in any field accompanied by an acceptance into the Teach For America program (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). If the center staff can prove they have tried to recruit a qualified candidate but were unable to hire someone, the center can apply for a 3-year waiver from these required qualifications (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008).

According to the Minimum Licensing Requirements for Child Care Centers, teachers in the district-funded program must meet specific educational and experience qualifications (Arkansas Division of Childcare and Early Childhood Education, 2011c). Teachers seeking employment must possess one of the following:

- a bachelor’s or higher degree in early childhood, child development or a related field;
• a bachelor’s degree in a non-related field plus either 4 years of experience in early childhood, a current CDA credential, or a birth to Pre-K credential;

• an associate’s degree in early childhood, child development, or a related field, plus six years of experience in early childhood education; or

• eight years of experience in early childhood education and completion of one of the following within two years of employment: (a) a CDA credential, (b) a birth-Pre K credential, (c) a director’s credential or the equivalent, or (d) a technical certificate in early childhood education. (Arkansas Division of Childcare and Early Childhood Education, 2011c, p. 23)

However, in the ABC preschool program, teachers must meet the following qualifications (Arkansas Department of Education, 2012a). First, the lead teacher must hold an Arkansas teacher’s license with P-4 certification. Second, if the ABC preschool program has multiple classroom sites, the teacher of the second classroom must hold at a minimum an associate’s degree in early childhood education or early childhood development. Third, both the lead teacher and the second classroom teacher must be able to demonstrate competency in the areas of developmentally appropriate programming, curriculum development, and classroom management. (Arkansas Department of Education, 2012a).

**Training**

In the area of training, each Head Start program is to create a professional development plan (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). This plan must be developed in collaboration with full-time employees who provide direct services to children and include not less than 15
clock hours of yearly professional development that is high quality, sustained, intensive, and classroom-focused. The plan must also be regularly evaluated for impact on the teacher and for staff effectiveness and be implemented by both the agency and the employee as long as the training is feasible and practicable (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008).

In the district-funded preschool, their training process requires that

- new directors, assistant directors, or site supervisors must attend a new directors’ orientation and both a Program Administration Scale and Environment Rating Scale training within six months of employment;
- all public-school preschool staff members who work directly with children must obtain at least 15 hours of training each year in the area of early childhood education; and
- the training must be focused on the age group where the majority of the teacher’s time is spent and must be registered with the Division of Child Care and Early Child Care and Early Education Professional Development Registry, the Department of Education, or the Department of Higher Education. (Arkansas Division of Childcare and Early Childhood Education, 2011c, pp. 25-26)

However, for ABC teachers’ training, the rules require that teachers and aides must have a minimum of 30 hours of staff development training on topics relevant to the early childhood education program; which includes Arkansas Early Childhood or Infant/Toddler Education Frameworks, Early Literacy Learning in Arkansas, INDEX (Math and Science for Young Children), Social/Emotional Learning in Arkansas, Work
Sampling Online, Child Outcome Planning and Administration, Deveraux Early Childhood Assessment, and Special Needs (Arkansas Department of Education, 2012b). Rules also allow that a person who is working on attaining an early childhood degree can count college course hours that are pertinent to the education of the early childhood learner toward the staff development hours. Next, staff members may be compelled by the Division of Child Care and Early Child Care and Early Education or ADE Special Education to attend additional training subject to the needs of various locations. Regulations state that coordinators must ensure that all appropriate staff members attend mandatory ABC training that includes training on budgets, reporting, assessments, information technology, and any other training relevant to the program and provided by Division of Child Care and Early Child Care and Early Education. Furthermore, the Division of Child Care and Early Child Care and Early Education must approve all staff training. Finally, staff members who do not adhere to the requirements are subject to the terms of a compliance plan (Arkansas Department of Education, 2012a).

Curriculum

Although the curriculum for Head Start is not dictated by the Department of Health and Human Services, the curriculum must be researched-based and possess developmentally appropriate education performance standards based on the Head Start Child Outcomes Framework that is designed to prepare students to be school-ready (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). The curriculum must be based on the Head Start Child Outcomes Framework and teach children in the program to develop and demonstrate knowledge and skills in language, literacy, mathematics, and science. In addition, the curriculum must
not only produce children with cognitive abilities related to academic achievement and child development, but also children who show appropriate social, emotional, and physical development, as well as abilities in creative arts (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008).

The district-funded preschools, under the authority of the Division of Child Care and Early Child Care and Early Education, must

- utilize an approved curriculum;
- provide weekly activity plans appropriate for the developmental needs of each group of children;
- provide experiences that meet children’s needs while stimulating learning in the developmental areas of physical, social/emotional, creative/aesthetic, cognitive/intellectual, and language;
- offer a variety of learning areas in the weekly activity plan, which include dramatic play, block play, books, art, language, literacy, mathematics, and science;
- give children the opportunity to work individually or in small groups for most of the day; and
- allow children to choose staff-directed or self-selected activities or even choose not to participate. (Arkansas Division of Childcare and Early Childhood Education, 2011a, p. 29)

However, for the ABC program, the curriculum must meet the following guidelines.

First, it must be planned around thematic units, projects, or topics of study and be arranged to include goals and objectives relating to cultural diversity, social/emotional
development, creative/aesthetic learning, cognitive/intellectual learning, physical development, and language (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). Second, the curriculum must be Division of Child Care and Early Child Care and Early Education-approved, unless a program requests permission to use something other than the list of approved curriculum in writing and must outline a daily schedule of varied activities, including indoor/outdoor, quiet/active, individual/small group/large group, gross motor/fine motor, and child-initiated/teacher-initiated (Arkansas Department of Education, 2012a). Third, the curriculum must use routine activities and transition times as opportunities for incidental learning, and outdoor play as an extension of the learning activities. Fourth, it must require all ABC students to participate in the planned activities and include a minimum of one hour of outdoor play each day for each classroom unless prevented due to inclement weather (Arkansas Department of Education, 2012a).

**Parental Involvement**

The Head Start program values parental involvement and works to help parents understand the importance of parental involvement in their child’s academic success. They demonstrate this by promoting activities that encourage parental involvement and engagement and adding family engagement as part of their parental involvement plan (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008). They also do this by broadening the term *family* to include anyone who has a parenting role in the child’s life (U.S. Department of Health & Human Services, Early Childhood Learning & Knowledge Center, 2008).
In the district-funded preschool program, parental involvement is paramount, and parents can visit their children anytime. To promote this involvement, each center must provide at least four of the six following opportunities:

- allow parents to observe, eat lunch with a child, or volunteer in the classroom;
- hold conferences at least once a year (and other times, as needed) to discuss children’s development and learning;
- have a parent resource area available, with books, pamphlets, or articles on parenting and child development;
- provide parent meetings with guest speakers or special events that might include an open house or a family activity night;
- keep parents informed of the center’s program and activities through a parents’ bulletin board, a regular newsletter, email, or a web page; or
- allow parents to participate in program and policy development planning meetings or in questionnaires or surveys. (Arkansas Division of Childcare and Early Childhood Education, 2011c, pp. 30-31)

In contrast, the ABC preschool must also have a plan for implementing parental involvement, including opportunities for parents to provide input into the program design and operation (Arkansas Department of Education, 2012a). Parental involvement plans must include instrumentation for parents to give advice and review the plan, conferences for parents to discuss their child’s progress, and ideas for ways parents can be involved in the child’s educational experience. These plans should also include an open-door policy where parents are encouraged to visit and participate in classroom activities throughout the school year and a parent handbook specifically for the ABC preschool program. In
addition, plans should provide for how the community, school, and other educational services cooperative agencies will work together to ensure the welfare, health, and safety needs of the children (Arkansas Department of Education, 2012a).

As just discussed, preschool programs have different requirements and guidelines in the areas of teacher qualifications, staff training, curriculum, and parental involvement to help ensure high-quality programs. By offering high-quality programs to early childhood learners, the ultimate goal is that Arkansas children will receive the best education possible. Three preschool programs, the Head Start program, district-funded preschool program, and the ABC preschool program were discussed. Of the three programs, the ABC preschool program stands out as the state of Arkansas’ pre-kindergarten program concerning the strictness of the requirements. To ensure Arkansas children are receiving the best possible education, studies evaluating that program have been conducted.

**Arkansas Better Chance Program Studies**

The ABC preschool program that is identified as the pre-kindergarten program of Arkansas was implemented in 1991. Since then, studies have been conducted within the state to evaluate its effectiveness, including these three studies analyzing the benefits of the ABC preschool program: Effects of the Arkansas Better Chance Program on Young Children’s School Readiness (Hustedt et al., 2007), The Longitudinal Effects of the Arkansas Better Chance Program: Findings from Kindergarten and First Grade (Hustedt, Barnett, & Jung, 2008), and The Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung et al., 2013).
The Effects of the ABC Program on Young Children’s School Readiness

There are three longitudinal studies specific to the ABC preschool program. In 2007, Hustedt et al. studied the effects of the ABC preschool program on school readiness. This study, the first in a series of reports on a 5-year longitudinal study, asked the question, does one year of the state-funded ABC preschool program for children at age 4 make an impact on the child’s academic skills when they enter kindergarten? Children for the study were chosen from a list of all ABC classrooms across the state.

In defining the two groups of children, a stringent age cutoff for enrollment eligibility was used (Hustedt et al., 2007). From the classrooms selected within each district, the researcher sampled twice the number of kindergarten classrooms than preschool classrooms. The kindergarten groups included one group of students who attended preschool at age 4 and one group who had no previous preschool experience. From this group, four children were randomly selected to participate in the study. This group was identified as the Preschool group or the Experimental group. The second group consisted of children who were currently attending an ABC preschool program and was identified as the No Preschool group or the Control group. Although this group of children was enrolled in the ABC preschool program, they were just beginning preschool and had not experienced the effects of participating in a preschool program.

According to researchers Hustedt et al. (2007), there were 911 children included in the study, with 407 children in the No Preschool group and 504 children in the Preschool group. The population consisted of 52% male children and 48% female children, and the major ethnic groups included 0.3% American Indian, 1% Asian, 6% Latino, 36% African American and 57% White. Children in the study were tested on
receptive vocabulary and mathematical skills. In the area of receptive vocabulary, 31% more growth occurred over the year by students in the ABC preschool program. For age equivalence, another means to measure children’s vocabulary knowledge, children who had participated in an ABC preschool program had approximately an additional four months of vocabulary development compared to students who had not attended an ABC preschool. According to Hustedt et al., vocabulary is a strong predictor of a child’s general cognitive abilities and later reading success. ABC preschool students also demonstrated an increase in scores in the area of mathematics skills. Specifically, those in the ABC preschool program experienced 37% more growth over the year in children’s mathematics scores in comparison to the Control group. The areas of mathematics included in the test were basic number concepts, simple addition, and subtraction, telling time, and counting money.

Children in the ABC preschool program also showed a significant increase in print awareness, with a 23% gain of more items answered correctly (Hustedt et al., 2007). Hustedt et al. (2007) noted, “This increase represents approximately 76% of a standard deviation on the Print Awareness subtest. The effect of the program can also be understood as more than doubling (116 percent more) growth over the year in children’s average print awareness scores” (p. 12). The results also showed that children involved in an ABC preschool program before entering kindergarten had the advantage of knowing more letters, knowing more letter-sound associations, and being more familiar with words and book concepts. In several measurable ways, it seems that children who attended an ABC preschool program had an advantage over children who had not attended preschool.
Effects of the ABC Program Findings from Kindergarten and First Grade

This study is a continuation of the Effects of the ABC Program on Young Children’s School Readiness. The study conducted by Hustedt et al. (2008) analyzed the children’s progress to kindergarten and first grade. To gather data for this longitudinal study, 68 Arkansas classrooms were observed in the spring of 2006. Observers gathered data on the overall classroom quality, classroom support for literacy skills, and classroom support for mathematics skills. The result of this study in the areas of overall classroom quality and classroom support for early literacy concluded good results in both. However, results suggested that classroom mathematics is an area where support might be needed (Hustedt et al., 2008).

The study also focused on the effects of the ABC preschool program at three key times: the beginning of the kindergarten year, the end of the kindergarten year, and at the end of the first grade year (Hustedt et al., 2008). Students in the study were classified into two cohort groups, Cohort 1 and Cohort 2. Students in Cohort 1 were children who entered kindergarten in the 2005-2006 school year. Cohort 1 participants were assessed at three points in time. Cohort 2, which was the younger of the two groups, included children who were 4 years old and attended the ABC preschool program during the 2005-2006 school year. Since students had not completed first grade at the time of the report, the data for this group covered only the kindergarten year (Hustedt et al., 2008).

Children entering kindergarten from Cohort 1 who participated in the ABC preschool program scored significantly higher in vocabulary than non-ABC children (Hustedt et al., 2008). The results showed students who had attended an ABC preschool program scored significantly higher than children who had not attended an ABC
preschool program in a pooled analysis from both cohort groups. However, at the end of first grade, students were again tested, and at this point, there was not a significant trend for ABC children in Cohort 1 to score higher than children who had not attended an ABC preschool program.

In the mathematical skills, early mathematics skills were not statistically significant findings for children in the Cohort 1 group upon entering kindergarten (Hustedt et al., 2008). At the end of kindergarten, in the area of early mathematics skills, the effects of the ABC preschool program showed there was no significant difference between children who attended an ABC preschool program and children who had not for Cohort 1. For Cohort 2 there was a slight increase. However, when analyzing the data for both cohort groups at the end of kindergarten in the area of applied problems, the scores were not statistically significant. So for the overall mathematics subject, when comparing ABC preschool program children with children who had not attended preschool, there was no statistically significant difference.

In the area of early literacy, or print awareness, children who had attended an ABC preschool program in Cohort 1 scored statistically higher than children who had not attended preschool (Hustedt et al., 2008). For Cohort 2 in the area of print awareness, scores were also statistically higher for students who had attended an ABC preschool program. The pooled data scores for both cohort groups, in the area of print awareness, were statistically higher at the beginning of the kindergarten year. At the end of first grade, ABC children in Cohort 1 group scored significantly higher on Letter-Word Identification than children who had not attended an ABC preschool program, but this was not true on word attack. According to the ABC preschool program studies conducted
by Hustedt et al. (2008), children who receive preschool have some advantage over children who have not attended preschool.

**Effects of the ABC Program: Findings from First Grade through Fourth Grade**

Jung et al. (2013) conducted the continuation of the longitudinal study of the Effects of the ABC preschool program through Fourth Grade. The study focused on two questions. The first question concerned the impact of an ABC preschool program regardless of whether the comparison group attended another preschool program. This included Head Start and private preschool. The second question addressed the impact of an ABC preschool program compared to not attending any center-based preschool at age 4. The report focused on results from spring 2008, 2009, and 2010 as students progressed through elementary school.

Jung et al. (2013), in addressing the first question, labeled the study ABC versus Other. Students from both cohorts those who attended non-ABC pre-K programs and children who attended no pre-K programs, were combined and compared to children who had attended an ABC preschool program. The second question addressed children in three distinct groups from both cohorts: those who attended ABC pre-K programs, those who attended non-ABC pre-kindergarten programs, and those who did not attend any pre-kindergarten program. This allowed the researcher to compare the effects of children who attended an ABC pre-kindergarten program to children who had not received any pre-kindergarten services. This approach was labeled ABC versus No Pre-K. The finding for the first through fourth-grade child outcomes measured in the ABC study focused on receptive vocabulary, mathematical skills, and early literacy.
Interestingly, the findings from the study showed no effects on any area through the end of fourth grade. According to Jung et al. (2013), the ability to find effects was limited because only half of the sampled children were old enough to have reached fourth grade by the end of the study. However, the effects of an ABC preschool program were stronger when ABC children were compared to children who had not attended any early childhood program. This suggests that Head Start and other preschools also produced achievement gains, though not on average as large as those from an ABC preschool program.

These previous ABC studies were done in the state of Arkansas. This study focuses on Arkansas as well, specifically on three rural Southwest Arkansas school districts. Students in rural areas face different challenges than student who live in urban areas. In Arkansas, more than one-third of all students attend rural schools, and more than half of all schools across the state serve rural communities (Johnson, Showalter, Klein, & Lester, 2014).

A study conducted by Miller and Votruba-Drzal (2012) described the early academic skills and childhood experiences of children from urban versus rural settings. The study utilized data from the Early Childhood Longitudinal Study, which is a program that includes three longitudinal studies that examine child development, school readiness, and early school experiences (National Center for Education Statistics, 2014). The researchers’ focus was on the differences in academic skills at kindergarten entry across large urban, small urban, suburban, and rural areas. The study also considered whether home environments and child care experiences explained disparities in early academic achievement.
The results showed that children in large urban and rural areas entered kindergarten with less advanced academic skills than children in small urban areas and suburbs. Lower achievement for rural children can be explained by two factors, the home environment and preschool services. Children with less advantageous home environments and increased use of home-based, instead of center-based preschools, demonstrated lower academic achievement (Miller & Votruba-Drzal, 2012).

Grace et al. (2006) further analyzed baseline data from the Early Childhood Longitudinal Study relative to young children’s care and development in rural settings. The baseline data were collected in the fall of 1998, when the original cohort of more than 21,000 children was entering kindergarten. Comparisons of the baseline data for rural and non-rural children in the Early Childhood Longitudinal Study revealed disparities for many school readiness indicators.

The analysis showed disparities by rurality overall and within racial/ethnic groups (Grace et al., 2006). There were particularly large differences on some indicators when rural Black children were contrasted with non-rural White children. Two areas where disparities were evident for the entering kindergartner included the areas of literacy and special education. When comparing non-rural White children to rural White children upon entering kindergarten in the area of letter recognition, 76.6% of non-rural White children and 66.3% of rural White children were proficient. When looking at the data of the Black children, 63.7% of the non-rural and 54.1% of the rural children were proficient. Special Education was another area where there was a gap. Rural children overall were 60% more likely to be placed in special education in kindergarten (Grace et al., 2006). Looking at the results, one finds significant gaps in the education of the rural
student. Though the data were collected for the purpose of longitudinal studies, currently none have been conducted comparing rural to non-rural students over longer periods of time.

**Conclusion**

Education is continually growing and changing. From the time of philosophers such as Plato to educational researchers such as Maria Montessori, educators and philosophers have worked to improve the quality of education. Throughout history, the importance of education has been stressed. Finding the best program has been a quest of researchers who have continually implemented studies and analyzed their results in search of the best programs. The existing research and literature have provided insights into the advantages preschool education has for the early childhood learner in the United States and Arkansas.

In an effort to look at a more homogenous study, this study looks only at rural Arkansas participants, and raises this question: Will the present research with data from students in Southwest rural Arkansas reveal different results than the previous ABC studies? The next chapter describes the design, procedures for data collection, and data analysis for the completion of the study.
CHAPTER III

 METHODOLOGY

Throughout history, philosophers and educational researchers have emphasized the need for an educated citizenry. Today’s educators rely on the information obtained from quality research studies to develop programs to educate the populace. Educators and researchers such as Froebel, Montessori, and Piaget have long stressed the benefits of beginning formal education in early childhood. The Perry Preschool Project (Weikart, 1970), the Carolina Abecedarian Project (Ramey et al., 1984), and the Chicago Child-Parent Center Program (Naisbitt, 1968) are three examples of early childhood education studies that have explored the impact of preschool program participation from a longitudinal perspective. These studies have provided evidence of the long-term benefits that preschool education gives throughout the lives of participating children.

Arkansans have worked to provide early childhood educational services for the state’s students. Programs in Arkansas that have impacted the education of the early childhood learner include the Head Start program; district funded, tuition-supplemented preschools; and the ABC preschool program. These programs have all played a part in the education of Arkansas’ early childhood learners. Early childhood education programs must strive for excellence. To provide such a program, the program must do the following: (a) hire teachers who possess the credentials of a highly qualified teacher, (b) provide ongoing staff training, (c) ensure the curriculum is scientifically-based and
developmentally appropriate for early childhood learners, and (d) have the support of the family through a strong parental involvement program (Arkansas Department of Education, 2012a).

The ABC preschool program is known as Arkansas’ preschool program. Studies have been conducted to determine the effectiveness of the ABC preschool program. Three studies, Effects of the Arkansas Better Chance Program on Young Children’s School Readiness (Hustedt et al., 2007); Longitudinal Effects of the Arkansas Better Chance Program: Findings from Kindergarten and First Grade (Hustedt et al., 2008); and Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung et al., 2013); were conducted. These studies were based on examinations of state-wide data sets. All three studies have provided some evidence of the benefits of an ABC preschool program education.

The question remains, however, are all students receiving the same quality education when looking at demographics within the state of Arkansas? A longitudinal study analyzing young children’s care and development in rural and non-rural settings was conducted by Grace et al. (2006). The study used baseline data of the birth and kindergarten cohorts of the National Early Childhood Longitudinal Study. Children in the study were predominately from the Southern and Midwestern part of the United States, and Black children were almost entirely from the South. The results of the study showed disparities by rurality overall and within racial/ethnic groups (Grace et al., 2006).

The purpose of this study was to examine, through quantitative methods, the effects of the Arkansas Better Chance preschool program participation versus no preschool participation on academic achievement in three rural Southwest Arkansas
school districts. While this chapter presents the research design and methods used to investigate the effects of the ABC preschool on academic achievement in the areas of literacy and mathematics, the factors of gender and ethnicity were also included in the study. Sections in this chapter include the research design of the study, the sample of the population, instrumentation, data collection procedures, analytical methods, and limitations.

**Research Design**

The research design of the study used a quantitative, causal-comparative strategy. Quantitative research permits the investigator to rely on statistical analysis (mathematical analysis) of the data that is typically in numeric form (Creswell, 2009). The numerical data, according to Gay, Mills, and Airasian (2012), allow the researcher to collect and analyze the data to describe, explain, predict, or control phenomena of interest.

According to Gay et al. (2012), the quantitative research method is based on the philosophical belief that people inhabit a coherent world that can be described as relatively stable and uniform. With stability and uniformity, people are able to understand, measure, and generalize about the world. One expert described quantitative research as being “strongly concerned with identifying causal, correlative or other kinds of close associations between events, processes, and consequences occurring in the mental and social lives of humans” (Reznitskaya, 2004, p. 68). This view was adopted from the natural sciences and implies the world people live in and the laws people abide by are predictable and can be understood by scientific research.

The design of this study is a quantitative, causal-comparative approach. In a causal-comparative study, the researcher does not use random assignment and does not
have control over the independent variables (Gliner & Morgan, 2000). Also, grouping variables like gender or ethnicity cannot or should not be manipulated (Newman & Benz, 1998). Instead, causal-comparative studies are used when information is needed in relation to cause-effect outcomes (Cohen, Manion, & Morrison, 2000). In this research, the researcher sought to determine the cause, or reason, for differences in the achievement of students enrolled in fourth grade in rural Arkansas.

Using a quantitative, causal-comparative strategy, the researcher in this study attempted to identify a cause-effect relationship between ABC preschool program participation and academic achievement by examining the Arkansas Grade 4 Augmented Benchmark Examination scores of fourth grade students and the independent variables of gender and ethnicity. In the first and third hypotheses, a 2 x 2 factorial between-groups design was used. The independent variables for these two hypotheses were gender (male versus female) and preschool participation (ABC preschool program versus no preschool participation). The dependent variables were literacy and mathematics achievement, as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade. The second and fourth hypotheses also used a 2 x 2 factorial between-groups design, with the independent variables being ethnicity (White versus non-White) and preschool participation (ABC preschool program versus no preschool). The dependent variables were literacy and mathematics achievement, as measured by the Arkansas Grade 4 Augmented Benchmark Examination, respectively.

Sample

The sample consisted of three school districts located in rural Southwest Arkansas. The four schools were chosen based on similar demographics and grade
configurations, and students who were in fourth grade and had taken the Arkansas Grade 4 Augmented Benchmark Examination were the focus of the study. The fourth grade students were identified as having participated in an ABC preschool program or having had no preschool participation, and by gender and ethnicity based on the APSCN and data retrieved from each of the participating districts.

Both male and female students, White and non-White students, and students who had participated in an ABC preschool program and students with no preschool participation were included in the sample. Students receiving special education services were excluded from the study. From the population of fourth grade students, participants for the study were randomly chosen using an online research randomizer (Urbaniak & Plous, 2013). Based on gender, participants included 30 male and 30 female students who had attended an ABC preschool program, and 30 male and 30 female students who had no preschool participation. Participants chosen based on ethnicity included 29 White students who had attended an ABC preschool program, 29 non-White students who had attended an ABC preschool program, 31 White students who had no preschool participation, and 31 students identified as non-White with no preschool participation.

**Instrumentation**

The researcher used the results from the spring 2013 administration of Arkansas Grade 4 Augmented Benchmark Examination. Fourth grade students were assessed using the Arkansas Grade 4 Augmented Benchmark Examination in both literacy and mathematics. The Arkansas Grade 4 Augmented Benchmark Examination includes the criterion-referenced test component and the norm-referenced component. The criterion-referenced test focuses on measuring student performance on items specifically
developed by Arkansas teachers and the Arkansas Department of Education (2012b) that align with the Arkansas Curriculum Frameworks for Mathematics and English Language Arts. The norm-referenced component focuses on rank-ordering student performance based on national norms and contains items in the subsections of reading comprehension, mathematics problem solving, and language (Arkansas Department of Education, 2013b).

Scale scores from the literacy and mathematics criterion-referenced test component were used. To obtain a scale score in literacy, the subtopics of reading and writing were evaluated. Specifically, the component of reading includes passages focused on literary, content, and practical knowledge, while the components within the area of writing are multiple-choice writing, content, style, sentence formation, usage, and mechanics. The mathematics scale scores were obtained from the components of number and operations, algebra, geometry, measurement, and data analysis. Arkansas state law and the State Board of Education regulations require the administration of criterion-referenced test, and all students in Grades 3-8 are expected to participate (Arkansas Department of Education, 2012b).

**Data Collection Procedures**

The Arkansas Grade 4 Augmented Benchmark Examination was administered to students in April of 2013. To gather the data, the researcher sent letters to the participating school districts to obtain and confidentially utilize school assessment records for the study. The letters were sent to the districts on April 8, 2014; the researcher received two of the three written permission forms on April 8, 2014 and the third on May 15, 2014.
The next step was to obtain the needed data. The researcher contacted each district and the Arkansas Research Center to retrieve the needed data. To ensure accuracy and credibility of the data, the researcher spoke with various people, including superintendents, school secretaries, educational cooperative personnel, school counselors, an APSCN coordinator, and Sarah Argue with the Arkansas Research Center. The researcher then compared Arkansas Grade 4 Augmented Benchmark Examination test scores of students who had attended an ABC preschool program against students who had no preschool participation.

For the first and third hypotheses, the Arkansas Grade 4 Augmented Benchmark Examination scale scores in literacy and mathematics, students’ gender, and preschool attendance were used. The data collected for gender and preschool attendance were coded as follows: gender (0 = male, 1 = female) and preschool attendance (0 = ABC preschool program, 1 = no preschool participation). For the second and fourth hypotheses, data collected consisted of Arkansas Grade 4 Benchmark Examination literacy and mathematics scale scores, student ethnicity, and preschool attendance. The following coding was utilized: ethnicity (0 = White, 1 = non-White) and preschool attendance (0 = ABC preschool program, 1 = no preschool participation).

**Analytical Methods**

The researcher began the analytical methods by examining the data from the three rural school districts. Once this was completed, the researcher began compiling the data into an Excel spreadsheet. The focus of the data was scale scores in literacy and mathematics, preschool attendance, ethnicity, and gender. Columns were made to identify each student’s scale score in literacy and mathematics, as well as the student’s preschool
attendance, ethnicity, and gender. The spreadsheet, once completed, was used to input data in the *IBM Statistical Package for the Social Sciences (SPSS) Version 22*.

The SPSS software was used to run a factorial ANOVA of the hypotheses. Prior to running the statistical analysis, assumptions of normality and homogeneity of variances were checked. In addition, descriptive statistics were used to examine the data. To address the first hypothesis, a 2 x 2 factorial ANOVA was conducted using preschool attendance (as identified by APSCN and received from district personnel) by gender as the independent variable, and the overall literacy achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. The second hypothesis was analyzed by a 2 x 2 factorial ANOVA with preschool attendance by ethnicity (White or non-White) as the independent variable, and the overall literacy achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. Hypothesis 3 was examined by a 2 x 2 factorial ANOVA using preschool attendance by gender as the independent variable, and mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable. The researcher conducted a 2 x 2 factorial ANOVA to test the fourth hypothesis with preschool attendance by ethnicity (White or non-White) as the independent variable, and the overall mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination as the dependent variable.

**Limitations**

This study sought to examine the relationship between preschool attendance and achievement in mathematics and literacy. To do this, the researcher examined Arkansas
Grade 4 Augmented Benchmark Examination literacy and mathematics scale scores. Although this is one accepted measurement to define student achievement, additional methods of analyzing student achievement could be implemented in other studies that may result in findings contrary to those identified in this study.

Another limitation of this study was the design. This study limited participation to those in three school districts in rural Southwest Arkansas. As a result, the findings from this study may not be generalizable when compared to districts in non-rural areas of Arkansas or rural districts in other states. The test data were limited to students in Arkansas who completed the Arkansas Grade 4 Augmented Benchmark Examination.

Testing is another area where there is an identifiable limitation. There is an assumption that the Arkansas Grade 4 Augmented Benchmark Examination was administered following the Arkansas Department of Education (2012a) rules and regulations, which require certified teachers to administer the test, specifications for the reading of materials, and required completion times. However, these attributes of the testing process were not confirmed by the researcher. It was also unknown if students were tested in small groups or whether student accommodations were in place during testing.

Another limitation to the study was the quality of the preschool experience. Specific aspects of the preschool programs were not investigated, leaving some unanswered questions: Did the program have a certified teacher? What was the recommended curriculum used in the program? How long was the school day? Was the student full-time or half-day? How many absences did the student have? How was student achievement assessed while students were in the ABC preschool program?
An additional limitation to the study involved the information provided within the student enrollment forms. It was unknown to the researcher if the information provided on the student’s enrollment form was correct. It was also unknown if the information from the student enrollment forms was correctly coded into APSCN with regard to gender, ethnicity, and preschool attendance.

The final limitation concerned the area of instruction. It was not known to the researcher if students in the study had received after-school tutoring or remedial instruction during school, or if they had been taught by a highly qualified teacher while in kindergarten through fourth grade. This information was not investigated when compiling data for the study.

This chapter presented the research design and methods to investigate the effects of the ABC preschool program on academic achievement in the areas of literacy and mathematics. Sections discussed in this chapter include the research design, sample of the population, instrumentation, data collection procedures, analytical methods, and limitations of the study. Chapter 4 reports the findings of the statistical analyses and includes descriptive statistics.
CHAPTER IV

RESULTS

The researcher used a quantitative, causal-comparative strategy for this study. Data for this study were comprised of existing standardized test scores for students at four rural elementary schools in three Southwest Arkansas school districts. The researcher focused on fourth-grade students from the combined population of the three school districts. The study included 30 male students who had participated in an ABC preschool program, 30 female students who had participated in an ABC preschool program, 30 male students who had no preschool participation, 30 female students who had no preschool participation, 29 White students who had participated in an ABC preschool program, 29 non-White students who had participated in an ABC preschool program, 31 White students who had no preschool participation, and 31 students identified as non-White with no preschool participation. The independent variables were the ABC preschool participation (ABC preschool program participation, no preschool participation), ethnicity (White, non-White), and gender. The dependent variables were literacy and mathematics achievement measured by scale scores from the Arkansas Grade 4 Augmented Benchmark Examination. A factorial ANOVA was run to test each of the four research hypotheses. The results of these analyses are in this chapter.
Hypothesis 1

Hypothesis 1 states that no significant difference will exist by gender between students who have participated an ABC preschool program and students with no preschool participation on literacy achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. To test this hypothesis, an ANOVA was conducted. Before conducting the ANOVA, the data were screened for outliers and examined for assumptions of independence of observations, normality, and homogeneity of variances. Table 1 displays the group means and standard deviations for ABC preschool program participation and no preschool participation by gender.

Table 1

Descriptive Statistics from the 2013 Arkansas Grade 4 Augmented Benchmark Examinations Literacy Scale Scores

<table>
<thead>
<tr>
<th>Gender</th>
<th>Program Participation</th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>ABC Preschool</td>
<td>720.67</td>
<td>124.80</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>702.80</td>
<td>155.01</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>711.73</td>
<td>139.81</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>ABC Preschool</td>
<td>808.90</td>
<td>130.66</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>763.20</td>
<td>129.21</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>786.05</td>
<td>130.88</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>ABC Preschool</td>
<td>764.78</td>
<td>134.26</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>733.00</td>
<td>144.72</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>748.89</td>
<td>139.92</td>
<td>120</td>
</tr>
</tbody>
</table>
An examination of box and whisker plots for each set of literacy achievement scores revealed one outlier. This outlier was in the male, no-preschool group, and was identified in all four of the hypotheses. The outlier was not greater than three standard deviations and was not an extreme outlier. Therefore, the outlier was retained in the study. The literacy scores represented a large scale with scores that ranged from 307 to 990 points. Due to the large range of the scores, the standard deviations may seem high, but were within range. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two preschool participation (ABC preschool program versus no preschool participation) and gender categories, the assumption of independence (which specifically applied to this variable) was met.

To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the four sets of literacy achievement scores. The shape of the histograms for each group, were not normally distributed. Results for the KS tests revealed no significant deviation from a normal distribution for the male ABC preschool program participants $D(30) = .200, p > .05$, or for male students with no preschool participation $D(30) = .200, p > .05$. Similarly, there was no significant deviation between female ABC preschool program participants $D(30) = .114, p > .05$, and female students with no preschool participation $D(30) = .200, p > .05$. Furthermore, Levene’s test revealed homogeneity of variance across groups, $F(1,116) = 1.03, p = .381$. A line plot indicated no interaction between gender and preschool participation. The results of the ANOVA are displayed in Table 2.
Table 2

*Factorial ANOVA Results from 2013 Arkansas Grade 4 Augmented Benchmark Examinations Literacy Scale Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>30305.41</td>
<td>1</td>
<td>30305.41</td>
<td>1.65</td>
<td>.201</td>
<td>0.01</td>
</tr>
<tr>
<td>Gender</td>
<td>165689.01</td>
<td>1</td>
<td>165689.01</td>
<td>9.03</td>
<td>.003</td>
<td>0.07</td>
</tr>
<tr>
<td>Preschool*Gender</td>
<td>5810.21</td>
<td>1</td>
<td>5810.21</td>
<td>0.32</td>
<td>.575</td>
<td>0.00</td>
</tr>
<tr>
<td>Error</td>
<td>2127836.97</td>
<td>116</td>
<td>18343.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>69630289.00</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the ANOVA analysis indicated no significant interaction between preschool participation/gender, $F(1, 116) = 0.32, p = .575, ES = 0.00$. Therefore, the null hypothesis could not be rejected. Further examination of the main effect for gender (male and female) and preschool participation (ABC preschool program participation and no preschool participation) was conducted (see Figure 1).
Figure 1. Mean literacy achievement for main effect of preschool participation and gender.

The examination of the main effect for preschool participation was not significant, $F(1, 116) = 1.65, p = .201, ES = 0.01$. However, the results revealed the main effect for gender was significant and showed a small effect size, $F(1, 116) = 9.03, p = .003, ES = 0.07$. Although the main effect for gender was significant, no post-hoc tests were needed. Because there were only two levels of this variable, no post-hoc tests were run. Therefore, the main effect of each variable was examined separately (see Figure 2).
Female students overall had higher scores than their male counterparts. Female students who had participated in an ABC preschool program scored higher ($M = 808.90, SD = 130.66$) than male students who had participated in an ABC preschool program ($M = 720.67, SD = 124.80$). Further analysis of the scores revealed female students who had no preschool participation had higher scores ($M = 763.20, SD = 129.21$) than male students who had no preschool participation ($M = 702.80, SD = 155.01$). Though the
display indicates there are substantial numerical differences between means, statistically there was no significant difference.

**Hypothesis 2**

Hypothesis 2 states that no significant difference will exist by ethnicity between students who have attended an ABC preschool program and students with no preschool participation on literacy achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. To test this hypothesis, an ANOVA was conducted. Before conducting the ANOVA, the data were screened for outliers and examined for the assumptions of independence of observations, normality, and homogeneity of variances. Table 3 displays the group means and standard deviations for preschool participation and ethnicity (White or non-White).
Table 3

Descriptive Statistics from 2013 Arkansas Grade 4 Augmented Benchmark Examinations Literacy Scale Scores

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Program Participation</th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>ABC Preschool</td>
<td>749.69</td>
<td>125.32</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>754.17</td>
<td>124.07</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>751.93</td>
<td>123.62</td>
<td>60</td>
</tr>
<tr>
<td>Non-White</td>
<td>ABC Preschool</td>
<td>778.90</td>
<td>142.72</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>713.19</td>
<td>161.20</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>746.05</td>
<td>154.58</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>ABC Preschool</td>
<td>764.78</td>
<td>134.26</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>733.00</td>
<td>144.72</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>748.89</td>
<td>139.92</td>
<td>120</td>
</tr>
</tbody>
</table>

An examination of box and whisker plots for each set of literacy achievement scores revealed no extreme outliers within the samples. However, two outliers were identified. The outliers were identified in the non-white, ABC preschool participation category (this outlier was found within all four hypotheses) and the non-White, no preschool participation category. Both outliers were not outside of three standard deviation points and therefore retained in the study. The examination of the standard deviation scores may seem high. This is due to the large range of scores, ranging from 307 to 990 points. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two preschool participation designations (ABC preschool program versus no preschool participation) and ethnicity categories (White and non-White), the assumption of independence was met.
To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the four sets of literacy achievement scores. The shape of the histograms for each group, were not normally distributed. The results for the KS tests revealed no significant deviation from a normal distribution for the White, ABC preschool participation $D(29) = .200, p > .05$, White, no preschool participation $D(29) = .200, p > .05$, as well as not White, ABC preschool program participation $D(31) = .200, p > .05$, and non-White, no preschool participation $D(31) = .200, p > .05$. Examination of the Levene’s test revealed homogeneity of variance across groups, $F(1, 116) = .459, p = .711$. A line plot indicated no significant interaction between ethnicity and whether or not there was preschool participation. Results of the ANOVA analysis are displayed in Table 4.

Table 4

*Factorial ANOVA Results from Arkansas Grade 4 Augmented Benchmark Examinations Literacy Scale Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>$F$</th>
<th>$p$</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>28084.28</td>
<td>1</td>
<td>28084.28</td>
<td>1.44</td>
<td>.232</td>
<td>.01</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>1037.01</td>
<td>1</td>
<td>1037.01</td>
<td>0.05</td>
<td>.818</td>
<td>.00</td>
</tr>
<tr>
<td>Preschool*Ethnicity</td>
<td>36911.28</td>
<td>1</td>
<td>36911.28</td>
<td>1.89</td>
<td>.171</td>
<td>.02</td>
</tr>
<tr>
<td>Error</td>
<td>22961387.89</td>
<td>116</td>
<td>19494.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>69630289.00</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the ANOVA analysis indicated no significant interaction between preschool program participation/ethnicity $F(1, 116) = 1.89, p = .171, ES = 0.02$. Therefore, the null hypothesis could not be rejected. Further examination of the main
effect for ethnicity (White, non-White) and preschool participation (ABC preschool program participation and no preschool participation) was conducted (see Figure 3).

Figure 3. Mean Literacy achievement for interaction of preschool participation/ethnicity.

The results indicate the main effect for ethnicity was not significant, $F(1, 116) = 0.05, p = .818, ES = 0.00$. Furthermore, the main effect for preschool participation was not significant, $F(1, 116) = 1.44, p = .232, ES = 0.01$. Given there was no significant interaction between the variables of preschool participation and ethnicity, the main effect of each variable was examined separately (see Figure 4).
The examination of the data between preschool participation/ethnicity revealed students who were non-White and had participated in an ABC preschool program (\(M = 778.90, SD = 142.72\)) had higher scores than White students who had also attended an ABC preschool program (\(M = 749.69, SD = 125.32\)). Students who were White and had no preschool participation (\(M = 754.17, SD = 124.07\)) had higher scores than non-White students (\(M = 713.19, SD = 161.20\)) who had no preschool participation. Although Figure 4 indicates there are some numerical differences between means, statistically there was no significant difference.
Hypothesis 3

Hypothesis 3 states that no significant difference will exist by gender between students who have attended an ABC preschool program or have no preschool participation on mathematics achievement measured by the Arkansas Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. To test this hypothesis an ANOVA was conducted. Before conducting the ANOVA, the data were screened for outliers and examined for assumptions of independence of observations, normality, and homogeneity of variances. Table 5 displays the group means and standard deviations for ABC preschool program participation and no preschool participation by gender.

Table 5

Descriptive Statistics from 2013 Arkansas Grade 4 Augmented Benchmark Examination Mathematics Scale Scores

<table>
<thead>
<tr>
<th>Gender</th>
<th>Program Participation</th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>ABC Preschool</td>
<td>654.27</td>
<td>93.65</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>653.50</td>
<td>99.05</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>653.88</td>
<td>95.57</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>ABC Preschool</td>
<td>682.07</td>
<td>81.56</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>636.37</td>
<td>63.07</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>659.22</td>
<td>75.87</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>ABC Preschool</td>
<td>668.17</td>
<td>88.19</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>644.93</td>
<td>82.78</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>656.55</td>
<td>85.96</td>
<td>120</td>
</tr>
</tbody>
</table>
An examination of box and whisker plots for each set of mathematics achievement scores revealed no extreme outliers within the samples. Nevertheless, three outliers were identified. The three outliers were identified in the male, ABC preschool participation group (one of these outliers was identified in all four hypotheses). The mathematics scores had a range of 400 to 924 points, which is a large range. However, the analyses of the standard deviations reveal the values are set closer to the mean of the data. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two preschool participation/gender categories (ABC preschool program versus no preschool participation and male versus female), the assumption of independence (which specifically applied to this variable) was met.

To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the four sets of mathematics achievement scores. The shape of the histograms for each group, were not normally distributed. Results for the KS tests revealed no signification deviation from a normal distribution for the male, ABC preschool program $D(30) = .200, p > .05$, as well the female, ABC preschool program students $D(30) = .200, p > .05$, and female students with no preschool participation $D(30) = .200, p > .05$. However, the assumption of normality was violated in the male, no preschool participation $D(30) = .029, p < .05$. Despite this violation, the ANOVA was deemed appropriate as it is robust relative to mild violations of the assumption of normality (Gay et al., 2012). Levene’s test revealed homogeneity of variance across groups, $F(1, 116) = 1.09, p = .355$. Results of the ANOVA are displayed in Table 6.
Table 6

*Factorial ANOVA Results from 2013 Arkansas Grade 4 Augmented Benchmark Examination Mathematics Scale Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>16193.63</td>
<td>1</td>
<td>16193.63</td>
<td>2.22</td>
<td>.139</td>
<td>0.02</td>
</tr>
<tr>
<td>Gender</td>
<td>853.33</td>
<td>1</td>
<td>853.33</td>
<td>0.12</td>
<td>.733</td>
<td>0.00</td>
</tr>
<tr>
<td>Preschool*Gender</td>
<td>15142.53</td>
<td>1</td>
<td>15142.53</td>
<td>2.07</td>
<td>.153</td>
<td>0.02</td>
</tr>
<tr>
<td>Error</td>
<td>847092.20</td>
<td>116</td>
<td>7302.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52606230.00</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *The mean difference is significant at the .05 level.

Results of the ANOVA analysis indicated no significant interaction between preschool participation and gender $F(1, 116) = 2.07, p = .153, ES = 0.02$. Therefore, the null hypothesis could not be rejected. The examination of the main effect for gender (male and female) and preschool participation (ABC preschool program participation and no preschool participation) was next conducted; its results are shown in Figure 5.
The main effect for gender (male and female) was not significant, $F(1, 116) = 0.12, p = .736, ES = 0.00$. Further analysis revealed the main effect for preschool participation was not significant, $F(1, 116) = .22, p = .139, ES = 0.02$. Given there was no significant interaction between variables of preschool participation and gender, the main effect of each variable was examined separately (see Figure 6).

Figure 5. Mean mathematics achievement for interaction of preschool participation and gender.
The female’s mean score for students who had participated in an ABC preschool program was higher ($M = 682.07, SD = 81.56$) than male students who had participated in an ABC preschool program ($M = 654.27, SD = 93.65$). However, male students with no preschool participation ($M = 653.50, SD = 63.07$) had higher scores than their female counterparts who had no preschool partition ($M = 636.37, SD = 63.07$). Though the display indicates there are some numerical differences between means, statistically there was no significant difference.

*Figure 6. Mean Mathematics achievement for preschool participation/gender main effect.*
Hypothesis 4

Hypothesis 4 states that no significant difference will exist by ethnicity between students who have attended an ABC preschool program and students with no preschool participation on mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. To test this hypothesis, an ANOVA was conducted. Before conducting the ANOVA, the data were screened for outliers and examined for the assumptions of independence of observations, normality, and homogeneity of variances. Table 7 displays the group means and standard deviations for preschool participation and ethnicity.

Table 7

*Descriptive Statistics from 2013 Arkansas Grade 4 Augmented Benchmark Examinations Mathematics Scale Scores*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Program Participation</th>
<th>M</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>ABC Preschool</td>
<td>664.62</td>
<td>87.42</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>646.14</td>
<td>92.41</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>655.38</td>
<td>89.65</td>
<td>60</td>
</tr>
<tr>
<td>Non-White</td>
<td>ABC Preschool</td>
<td>671.48</td>
<td>90.21</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>643.81</td>
<td>74.18</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>657.65</td>
<td>83.08</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>ABC Preschool</td>
<td>668.17</td>
<td>88.19</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>No Preschool</td>
<td>644.93</td>
<td>82.78</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>656.55</td>
<td>85.96</td>
<td>120</td>
</tr>
</tbody>
</table>
An examination of box and whisker plots for each set of mathematics achievement scores revealed outliers in all four categories. There were two outliers identified in the White, ABC preschool participation category; three outliers in the White, no preschool participation category; three outliers in the non-White, ABC preschool participation category (one of these outliers was identified in all four hypotheses); and one outlier in the non-White, no preschool participation category. However, none of the outliers were extreme and all were retained in the study.

The mathematics scores had a range of 400 to 924 points. Although there is a vast range in the scores, standard deviations reveal the values are set closer to the mean of the data. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two preschool participation/ethnicity categories (ABC preschool program versus no preschool participation and White and non-White), the assumption of independence (which specifically applied to this variable) was met.

To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the four sets of mathematics achievement scores. The shape of the histograms for each group, were not normally distributed. The results for the KS tests revealed no significant deviation from a normal distribution for the White, ABC preschool participation $D(29) = .200, p > .05$, White, no preschool participation $D(29) = .116 p > .05$. Similarly, the non-White, ABC preschool program participation $D(31) = .200, p > .05$, and non-White, no preschool participation $D(31) = .200, p > .05$. Examination of the Levene’s test revealed homogeneity of variance across groups, $F(1, 116) = 0.32, p = .812$. A line plot indicated no significant
interaction between ethnicity and preschool participation. Results of the ANOVA analysis are displayed in Table 8.

Table 8

Factorial ANOVA Results from 2013 Arkansas Grade 4 Augmented Benchmark Examination Mathematics Scale Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschool</td>
<td>15962.95</td>
<td>1</td>
<td>15962.96</td>
<td>2.15</td>
<td>.146</td>
<td>0.02</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>153.85</td>
<td>1</td>
<td>153.85</td>
<td>0.02</td>
<td>.886</td>
<td>0.00</td>
</tr>
<tr>
<td>Preschool*Ethnicity</td>
<td>633.36</td>
<td>1</td>
<td>633.36</td>
<td>0.09</td>
<td>.771</td>
<td>0.00</td>
</tr>
<tr>
<td>Error</td>
<td>862300.86</td>
<td>116</td>
<td>7433.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52606230.00</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *The mean difference is significant at the .05 level.

Results of the ANOVA analysis indicated no significant interaction between preschool participation and ethnicity $F(1, 116) = 0.09, p = .771, ES = 0.00$. Therefore, the null hypothesis could not be rejected. Examination of the main effect for ethnicity (White and non-White) and preschool participation (ABC preschool program participation and no preschool participation) was conducted (see Figure7).
The results revealed the main effect for ethnicity (White and non-White) was not significant, $F(1, 116) = 0.02, p = .886, ES = 0.00$. Further analysis revealed the main effect for preschool attendance was not significant, $F(1, 116) = 2.15, p = .146, ES = 0.02$. Given there was no significant interaction between the variables of preschool participation and ethnicity, the main effect of each variable was examined separately (see Figure 8).
The examination of the data revealed students who had participated in an ABC preschool program and were non-White ($M = 671.48$, $SD = 90.21$) had scores that were higher than the White ($M = 664.62$, $SD = 87.42$) students who had participated in an ABC preschool program. Students who had no preschool participation and were White ($M = 646.14$, $SD = 92.41$) had higher scores than non-White ($M = 643.81$, $SD = 74.18$) students with no preschool. Though the display indicates some numerical differences between means, statistically there was no significant difference.

*Figure 8.* Mean mathematics achievement for preschool participation/ethnicity main effect.
This chapter presented the statistical analyses of the study. The hypotheses were analyzed by conducting descriptive statistics and an ANOVA. However, before conducting an ANOVA, the researcher screened for outliers and examined for assumptions of independence of observations, normality, and homogeneity of variances. Chapter 5 discusses the interpretation of the data.
CHAPTER V
DISCUSSION

The current study evaluated the effects of an ABC preschool program education on academic achievement in fourth grade. Findings from the study show there were no significant differences on the long-term academic outcomes associated with preschool participation based on gender and ethnicity. In fact, based on the findings of this study and other research, it appears the academic benefits of participating in a preschool program diminish by fourth grade (Jung et al., 2013). Previous research studies on the academic benefits of participating in a preschool program were examined and include the Perry Preschool Project (Weikart, 1970), the Carolina Abecedarian Project (Ramey et al., 1984), the Chicago Child-Parent Center Program (Waisman Center, 2014), and the ABC studies. The ABC studies consist of the Effects of the Arkansas Better Chance Program on Young Children’s School Readiness (Hustedt et al., 2007), The Longitudinal Effects of the Arkansas Better Chance Program: Findings from Kindergarten and First Grade (Hustedt et al., 2008), and The Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung et al., 2013).

The focus of this study was to describe and compare the effects of an ABC preschool program versus no preschool participation on academic achievement at fourth grade. Three school districts comprised of four elementary schools in total were included in the study. This chapter presents the researcher’s conclusions, based on exploring and
Conclusions

All four hypotheses were analyzed using a 2 x 2 between groups factorial ANOVA. Hypotheses 1 and 3 explored the interaction of the variables of gender and preschool participation on literacy or mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination. In addition, Hypotheses 2 and 4 examined the interaction of the variables of ethnicity and preschool participation on literacy or mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination. To test the null hypotheses, the researcher conducted a factorial ANOVA. The interaction and main effects were examined in each of the four hypotheses. The following hypotheses guided the study, with each hypothesis examined and conclusions determined based on findings:

Hypothesis 1

Hypothesis 1 stated that no significant difference will exist by gender between students who have attended an ABC preschool program and students who have had no preschool participation on literacy achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. Findings revealed no significant interaction of the variables of gender and preschool participation. Examinations of the literacy scores indicated there were no statistically significant differences between the literacy scores of students who
had participated in an ABC preschool program and those who had not participated in a preschool program based on gender.

Upon further examination, the main effect for gender was significant. Female students who had participated in an ABC preschool program had higher literacy scores than the male students who also participated in an ABC preschool program. Likewise, female students who had no preschool participation had higher literacy scores than their male counterparts. The main effect for preschool participation was not significant. Literacy scores of students participating in an ABC preschool program were not significantly different from the literacy achievement scores of students who had no preschool participation. Based on these results, there was not enough evidence to reject the null hypotheses.

**Hypothesis 2**

Hypothesis 2 stated that no significant difference will exist by ethnicity between students who have attended an ABC preschool program and students who have had no preschool participation on literacy achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. Findings revealed no significant interaction of the variables, ethnicity and preschool participation. Literacy scores of White students who had participated in an ABC preschool program were not significantly different from literacy scores of non-White students who had participated in an ABC preschool program. Also, literacy scores of students who had participated in an ABC preschool program were not significantly different from literacy scores of students who had no preschool
participation. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for ethnicity was not significant. Literacy achievement of White students was not significantly different from literacy achievement of non-White students. Furthermore, the main effect for preschool participation was not significant. Literacy achievement scores of ABC preschool program students were not significantly different from the literacy scores of students who had no preschool participation.

**Hypothesis 3**

Hypothesis 3 stated that no significant difference will exist by gender between students who have attended an ABC preschool program and students who have had no preschool participation on mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. Findings revealed no significant interaction of the variables of gender and preschool participation. Mathematics scores of males who had participated in an ABC preschool program were not significantly different from mathematics scores of males who had no preschool participation. Likewise, mathematics score of females who had participated in an ABC preschool were not significantly different from mathematics scores of females who had no preschool participation. Based on these results, there was not enough evidence to reject the null hypothesis.

Upon further examination, the main effect for gender was not significant. Mathematics achievement scores of males were not significantly different from mathematics achievement scores of females. Furthermore, the main effect for preschool participation was not significant. Mathematics achievement scores of students who had
participated in an ABC preschool program were not significantly different from the mathematics achievement scores of students who had no preschool participation.

**Hypothesis 4**

Hypothesis 4 stated that no significant difference will exist by ethnicity between students who have attended an ABC preschool program and students who had no preschool participation on mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination for fourth grade students in three Southwest Arkansas school districts. Findings revealed no significant interaction of the variables of ethnicity and preschool participation. Mathematics scores of White students who had participated in an ABC preschool program were not significantly different from mathematics scores of non-White students who had participated in an ABC preschool program. Also, mathematics scores of White students who had not participated in an ABC preschool program were not significantly different from mathematics scores of non-White students who had no preschool participation. Based on these results, there was not enough evidence to reject the null hypothesis.

In addition, the main effect for ethnicity was not significant. Mathematics achievement of White students was not significantly different from mathematics achievement of non-White students. Furthermore, the main effect for preschool participation was not significant; mathematics achievement scores of ABC preschool program students were not significantly different from the mathematics scores of students who had no preschool participation.

In summary, each of the four hypotheses found no significant interaction of preschool participation based on literacy and mathematics achievement at Grade 4. In
Hypotheses 1 and 3, there was no significant interaction of the variables of gender and preschool participation on literacy or mathematics achievement. In Hypotheses 2 and 4, there was no significant interaction of the variables of ethnicity and preschool participation on literacy and mathematics achievement. This study reveals little impact by gender or ethnicity on either literacy achievement or mathematics achievement based on participation in an ABC preschool program versus no preschool participation. Also, there was no significant difference in literacy or mathematics achievement scores when each of the hypotheses was examined for the main effect of each variable. Literacy and mathematics scores of students who have participated in an ABC preschool program were not significantly different from those students who had no preschool participation.

**Implications**

The outcomes of this study must be examined within the context of whether or not preschool participation enhances academic outcomes beyond kindergarten readiness. The results of this study, which found no significant difference in literacy or mathematics achievement by gender or ethnicity status, contribute to the mixed results of the studies examined in the review of literature. However, some of the findings in this study remained consistent with the results of the studies examined in the review of literature.

**Expanding Measure of Academic Achievement**

Previous studies have been conducted identifying factors that have an impact on the education of the early childhood learner. This study measured the impact of participating in an ABC preschool program by gender and ethnicity status on literacy and mathematics achievement, after a period of five years, as measured by standardized assessment. In past years, studies analyzed the effects of participating in a preschool
program. The studies examined within the context of the literature review used various means of assessment. This study expanded the means of standardized testing to include the Arkansas Grade 4 Augmented Benchmark Examination. A comparative analysis of the preschool studies previously mentioned and the current study has been conducted. The similarities and inconsistencies are discussed in regard to gender and ethnicity which may be associated with participation in a preschool program. This section concludes with the generalization and limitations of the study.

**Gender**

The current study’s purpose was to determine the effects by gender of students participating in an ABC preschool program versus students never participating in preschool on literacy and mathematics achievement as measured from the Arkansas Grade 4 Augmented Benchmark Examination. The findings showed that there were no significant differences based on gender in either literacy or mathematics. These results are comparable to other studies conducted at a similar point during school careers, such as the Perry Preschool Project (Schweinhart et al., 2005) and The Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung et al., 2013).

However, previous studies have indicated that there may be an effect by gender which might appear later in life which carries beyond academic success. This is shown in the research conducted in the Perry Preschool Project (Schweinhart et al., 2005) which revealed participants had fewer arrests. The study on the Effects of a School-Based, Early Childhood Intervention on Adult Health and Well-being A 19-Year Follow-up of Low-Income Families (Reynolds et al., 2007), revealed participants in the Chicago Child-
Parent Center Program had less incarceration. The Carolina Abecedarian Project (2014) participants benefited by having a higher-income and had a lower chance of being involved in a crime.

Although this researcher found there were no significant effects based on gender, the study did reveal some interesting information. Based on the literacy scores, females students who had participated in an ABC preschool program and who had not participated in a preschool program scored higher than their male counterparts. In mathematics, female students who had participated in an ABC preschool program again had higher scores than male students with no preschool participation. However, male students who had no preschool participation scored higher than female students with no preschool participation. The results of no significant differences reveal the narrowing of the scores, which may show progress is being made to close the achievement gaps between males and females in both literacy and mathematics achievement.

**Ethnicity**

The current study examined the difference by ethnicity between students who have attended an ABC preschool program and students who had no preschool participation on literacy and mathematics achievement as measured by the Arkansas Grade 4 Augmented Benchmark Examination. The results showed no significant differences between students who were White and students of non-White origins on participation in an ABC preschool program. Although there were no significant differences, the results from the current study were interesting. Findings reveal students who were non-White and had participated in an ABC preschool program scores were higher in literacy than White student who had also attended an ABC preschool program.
based on the Arkansas Grade 4 Augmented Benchmark Examination. In the area of mathematics, the findings also show students who had participated in an ABC preschool program and were non-White had scores that were higher than the White students who had participated in an ABC preschool program. Students who had no preschool participation and were White had higher scores than non-White students with no preschool. Further discussion of the effects based on ethnicity follows.

The conclusions of this study agree with the findings of the Longitudinal Effects of the Arkansas Better Chance Program: Findings from First Grade through Fourth Grade (Jung et al., 2013). This study took into account the covariate of ethnicity by adjusting the mean scores for ethnicity. The researchers found that there were no significant academic effects at Grade 4 associated with participating in an ABC preschool program, based on ethnicity.

The Perry Preschool Study, the Abecedarian Project, and the Chicago Child-Parent Center Program did not report results based on ethnicity. Participants in the Perry Preschool Study were African American children from disadvantaged families (Weikart, 1970). The same was true for both the Abecedarian Project, and Chicago Child-Parent Center Program participants. The Abecedarian Project participants were from low-income families and were 98% African American, with 83% of the students in the project being raised by a single mother (Ramey et al., 1984). The Chicago Child-Parent Center Program participants were also from parents who were considered low-income. The participants from the Chicago Child-Parent Center Program were predominantly African American and were considered high-poverty students (Waisman Center, 2014).
In summary, this researcher found no significant differences between the scores of students who are White or non-White based on participation in an ABC preschool program as measured by the Arkansas Grade 4 Augmented Benchmark Examination. The results of no significant difference demonstrate a narrowing of the scores. The narrowing of the scores reveals progress is being made to close the achievement gap between White and non-White students who have participated in an ABC preschool program.

**Generalizations**

This study fills a gap within the scope of previous research based on academic achievement as a result of participating in a preschool program. Specifically, this study looked at gender, which was previously researched, but also examined ethnicity in rural Southwest Arkansas. The current study supports previous findings with regard to participation in a preschool program. The current study, conducted in three rural Southwest Arkansas school districts and comprised of four schools, joins existing research conducted in Arkansas (Jung et al., 2013; Naisbitt, 1968; Weikart, 1970). In addition, the study by Grace et al. (2006) regarding rural disparities and the study by Miller and Votruba-Drzal (2012) on early academic skills and childhood experiences in the urban-rural settings brought insights into the education of rural students. Since previous research was not evaluated using standardized assessments, this study expanded the definition of academic achievement to include literacy and mathematics scores as measured by standardized assessment utilizing the Arkansas Grade 4 Augmented Benchmark Examination.

In order to make broad generalizations regarding the impact of participating in an ABC preschool program on academic achievement based on gender and ethnicity, two
factors must be considered. First, the ABC preschool program itself must be discussed. Second, an evaluation of each school’s profile as reported by the Arkansas Department of Education must be examined. To analyze each school’s profile, schools are classified as School A, School B, School C, and School D.

Students participating in the ABC program were identified by the APSCN or from information obtained from the school district’s personnel. The ABC preschool programs have specific licensing requirements. Each classroom can have no more than 20 children ages 3-5 years, and there must be a teacher for every 10 students. The teachers in the program must possess an Arkansas teaching license. The researcher assumed that all these requirements were met by each ABC preschool program.

In the analysis of the demographics of the schools participating in this study, it is important to take into account previous research by Miller and Votruba-Drzal (2012). This research showed that children in large urban and rural areas entered kindergarten with fewer advanced academic skills than children in small urban areas and suburbs (Miller & Votruba-Drzal, 2012). Although this may be representative of other rural areas, this is not true for rural Southwest Arkansas. These rural Arkansas schools possess unique characteristics that are unlike what you may find in other rural or urban areas. There are three unique characteristics that this researcher has identified in the four rural schools included in this study. These unique characteristics include smaller class sizes, school as a part of the community, and the teachers. First of all, the class sizes are smaller; this allows more one-on-one instruction by the teachers. Second, the school is a vital part of the community; one might say the school is the heart of the community. Third, most of the teachers grew up in the community and have many years of teaching
experience. These veteran teachers have vested interest in their students’ academic success. After all, many not only know their students, but may have gone to school with their students’ parents or grandparents. These teachers take ownership in the education of their students. Being in a smaller size class, living in a community where the school is the center of the community, and having teachers that have ownership in their students’ education might lead to improved academic performance.

Regarding the demographics of the schools participating in this study, the student population in School A was 555 students in Grades 3 through 5. The average class size was 19 students, and teachers had an average of 15 years of teaching experience. In looking at Grade 4 specifically, there were 190 students in eight classrooms, with an average class size of 23. School A was composed of 73% non-White students and 27% White students. In School A, 79% of the students were eligible to receive free or reduced-cost lunches. Academically, Grade 4 students were high-performing, with 95% scoring proficient or advanced in literacy and 97% scoring proficient or advanced in mathematics.

School B had 322 students in kindergarten through Grade 6. The average class size was 14, and the average years of teaching experience was 15 years. For Grade 4, there were 39 students in two classrooms. This allowed for one class to have 20 students and one to have 19. The demographics of School B were 48% non-White and 52% White. All 322 students in the school received free lunches. Academically, School B students performed well in Grade 4, with 95% of students scoring proficient or advanced in both literacy and mathematics.
School C had 407 students in Grades 3 through 5. The average class size was 20 students, and teachers had an average of 17 years of teaching experience. Grade 4 had a total of 132 students in six classrooms. The average class size for Grade 4 was 22 students, and the student population was 5% non-White and 95% White. Of the 407 students, 70% qualified for free or reduced lunches. Academically, School C was a high-performing school with 92% of Grade 4 students scoring 92% proficient or advanced in literacy, and 90% scoring proficient or advanced in mathematics.

School D had 214 students in kindergarten through Grade 6. The average class size was 14 students, and the average number of years of teaching experience was 9. There were 27 students in Grade 4 in two classrooms. The student body was comprised of 20% non-White and 80% White. All of the 214 students received free lunches. Academically, School D was a high-performing school with 95% of the students scoring proficient or advanced in literacy and 100% scoring proficient or advanced in mathematics in Grade 4.

In summary, the number of the students in the Grade 4 classroom ranged from 27 to 190 among the four schools. School D had the smallest class size with 13 to 14 students, while the other 3 schools had classes of 19, 20, 22, and 23. In looking at ethnicity, School A had the highest percentage of non-White students (73%), followed by School B (48%), School D (20%), and School C (5%). All schools had a high percentage of students who qualified for free or reduced lunches. Schools B and D had 100%, School A had 79%, and School C had 70%. Students in all four schools were high-performing in literacy, with Schools A, B, and D scoring 95% proficient or advanced, and School C
scoring 92%. In mathematics, the schools were also high-performing, with School D scoring 100%; School A scoring 97%, School B scoring 95%, and School C scoring 90%.

To evaluate the School Report Card for 2013 for each school, norm-referenced test results were analyzed and compared to the state score. The state average was 53 for reading and 61 for mathematics. School A had a score of 46 in reading and 64 in mathematics, making its reading score seven points below the state average and its mathematics score 2 points above the state average. School B had scores of 52 in reading and 71 in mathematics. Compared to the state average, School B was 1 point below the state average in reading and 10 points above the state average in mathematics. School C had scores of 61 in reading and 71 in mathematics; making its reading score 8 points above the state average and its mathematics score 10 points above. School D had scores of 67 in reading and 72 in mathematics. Like School C, School D was above the state average in reading and mathematics, 14 points above in reading and 11 in mathematics. Compared with schools across the state of Arkansas, Schools C and D are well above the state average in both reading and mathematics. School A was lower in reading by 7 points, and School B was lower by 1 point. All schools were above the state’s average score in mathematics.

From the analysis of the schools’ profiles, the majority of students in Grade 4 from the three rural districts had proficient or advanced scores. The norm-referenced testing for all four schools revealed scores were above the state’s average in mathematics. In literacy, two of the four schools were higher than the state’s average in reading, while two were below. Overall, students in Grade 4 were high performing, high achieving students. The fact that all participants functioned within schools with small class sizes
and experienced teachers may have diminished differences between those students who had no preschool and those who did. Because of the unique setting of rural Southwest Arkansas, students have access to smaller class sizes, teachers who have many years of teaching experience, and who are members of the community. Many of these teachers personally know not only their students, but their student’s families, too. Therefore, they have a personal connection and a valid interest in their students’ academic success. Therefore, because of the characteristics of these rural Arkansas schools, results may not be generalizable beyond these settings.

Limitations

The analysis of the current study on the academic achievement of students in fourth grade, presented numerous limitations. Each limitation is important to consider in this study. The following is a detailed discussion of the each of the limitations.

The first limitation to be discussed is preschool as an early childhood intervention. Although preschool programs do provide benefits to the early childhood learner in the form of kindergarten readiness skills (Hustedt et al., 2007), the focus of this study was to determine the academic effects at fourth grade from having participated in a preschool program. Therefore, this researcher did not look at preschool as an early intervention. Specifically, the results of this study are most relevant to primary/elementary schools and specifically to teachers and administrators as they consider long-lasting effects of preschool participation.

Another limitation of this study was the demographics. The rural Southwest portion of the state of Arkansas was chosen for the study and limited the participation to students in three rural school districts. Enlarging the demographics pool to include
schools in various parts of the state, or in other states, would enable the researcher to look at a more diversified population.

In addition, social-economic status was a limitation to the study. The researcher did not examine participants based on socio-economic status. Therefore, it was unknown to the researcher if the student qualified for, or did not qualify for, free/reduced lunches.

Another limitation to the study was the parent dynamics of the students. It was unknown to the researcher if the students were being raised by both parents, father only, mother only, stepfather, stepmother, grandmother, grandfather, or another relative. According to the following studies, the Perry Preschool Project (Weikart, 1970), the Carolina Abecedarian Project (Ramey et al., 1984), and the Chicago Child-Parent Center Program (Waisman Center, 2014), parental involvement is a key factor in student success.

Additionally, student attendance and tardiness data were not examined within the context of this study. It was unknown to the researcher if a student was chronically absent or late for school. According to Balfanz and Byrnes (2012), chronic absenteeism increases achievement gaps at the elementary, middle, and high school levels. With an increase in achievement gaps, absenteeism can have a chronic impact on a student’s academic performance throughout the student’s educational career.

The researcher did not attempt to examine the quality of the preschool experience. This is a limitation. Specific aspects of the program were unknown to the researcher. Although the ABC preschool program has specific guidelines and rules to ensure a quality program, the actual day-to-day environment and fidelity of implementation of each program was not known to the researcher.
A further limitation to the study was no attempt to control for instruction interventions and teacher qualifications. It was not known to the researcher if students from kindergarten to fourth grade received any interventions in the form of after-school tutoring or remediation instruction during the day. Also, it was unknown to the researcher if students were being taught by a quality teacher while in kindergarten through fourth grade.

A final limitation to the study was the method of measuring student achievement. This study used only the Arkansas Grade 4 Augmented Benchmark Examination. Other methods to examine student achievement might be administered. Although there seem to be many limitations, each provides an important limitation that was beyond the control of the researcher.

**Recommendations**

**Potential for Practice/Policy**

This researcher found the benefits of preschool diminish by fourth grade. Based on these findings, administrators should be mindful that preschool participation is not detrimental to the education of the early childhood learner, and providing a preschool program might help the preschool learner. Nevertheless, when looking at the long-lasting benefits of preschool, administrators should not expect to see academic benefits, in a rural setting, by the time the student reaches fourth grade.

Results of this study also found that based on ethnicity, students who were non-White and had participated in an ABC preschool program had higher scores in both literacy and mathematics than students who were White and had participated in an ABC preschool program. Therefore, administrators should continue any programs they are
providing to help the non-white students. Based on these results, students who are non-White are narrowing the achievement gap.

Findings from this study reveal the majority of students in Grade 4 from the three rural districts had proficient or advanced scores. With scores of proficient or advanced, these students are high performing, high achieving in both literacy and mathematics. With the majority of the students being high performing, high achieving students, administrators might look at ways to implement or increase student involvement for both male and female students in science, technology, engineering, and mathematics (STEM) education programs. Encouraging students to take an interest in STEM at an early age could provide an opportunity for students to excel educationally. From the results of their achievement on the Arkansas Grade 4 Augmented Benchmark Examination, these students are up to the challenge.

**Future Research Considerations**

The findings of this study reveal no significant differences between students who had participated in the ABC preschool program and students who had no preschool participation based on gender and ethnicity and measured by the Arkansas Grade 4 Augmented Benchmark Examination. These findings mirrored the results of the findings of Jung et al. (2013) showing the benefits of preschool diminish at fourth grade. However, further research is needed to provide educational practitioners a better understanding of the effects of participating in a preschool program. Therefore, several recommendations are proposed for future study might include:

1. Based on the findings within this study, students who have not participated in an ABC preschool program are able to achieve the same academic level, in
fourth grade, as students who had participated in an ABC preschool program.
A future study to determine the interventions required for students who have participated in a preschool program versus those who have no preschool participation could be considered.

2. The present study did not consider variables such as grade retention, student attendance, student behavior records, graduation rates, or family structures. Researchers might consider these variables when conducting future studies. These school and family-based variables may allow the researcher to identify factors that can have an impact on student achievement and academic success.

3. A more detailed study could also be done to determine if the level of educational attainment of parents has an effect on the student’s academic achievement. The study could include one or both parents and identify the parents’ levels of education and types of degree. This may enable the researcher to explore the value parents place on education.

4. This study could be replicated in several rural elementary schools. Various rural populations across the state and other states could be chosen. This would allow the researcher to consider various rural locations and compare the findings.

5. This study could be repeated using a larger sample size from various rural location sites and follow students through graduation to see if preschool participation has an impact on academic success beyond the elementary years.

In conclusion, the findings from the study reveal there were no statistically significant differences between students who had participated in an ABC preschool
program, based on gender and ethnicity, than students who had no preschool participation at Grade 4 in three rural Southwest Arkansas school districts. These rural Southwest Arkansas schools have characteristics that are unlike schools in the urban or suburban areas of Arkansas. This researcher found participating schools had smaller class sizes, tenured teachers who took ownership in the academic success of their students, and a school environment that is nurturing and is considered a vital part of the community. These schools are attending to the education of their students. This is evident in the academic achievement of their students. Scores for all four schools were considered high performing. These scores seem to indicate that it does not matter if you have participated in an ABC preschool or if you have not.

In addition, findings from the study show the effects of a preschool education diminish by the fourth grade. These results are in agreement with the findings from previous research which reveals the academic benefits of preschool seem to diminish academically by fourth grade. Therefore, based on these findings, this researcher cannot recommend that students who reside in stable, rural communities participate in an ABC preschool program for the sole purpose of gains in academic achievement.
REFERENCES


APPENDIX

Status of Request for Exemption from IRB Review
(For Board Use Only)

Date: 5/6/14
Proposal Number: 2014-041

Title of Project: Effects of the Arkansas Better Chance Program Preschool Participation versus No Participation on Academic Achievement

Principal Investigator(s) and Co-Investigator(s): Netlia Cureton ncureton@harding.edu

[ ] 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