EFFECTS OF ATTENDING PREKINDERGARTEN ON KINDERGARTEN EMERGENT LITERACY SKILLS

by

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This dissertation is dedicated to the memory of my maternal Grandfather: John Wesley “Monk” Gainer and to the memory of my sister, Valishia Nicole Wade.

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First, I want to thank my Father, God Almighty for allowing me the opportunity, strength, courage, and frame of mind to accomplish this task. Without His grace and mercy, none of this would have been possible.

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Psalms 150:

1 Praise the LORD.[a]
Praise God in his sanctuary;
praise him in his mighty heavens.
2 Praise him for his acts of power;
praise him for his surpassing greatness.
3 Praise him with the sounding of the trumpet,
praise him with the harp and lyre,
4 praise him with timbrel and dancing,
praise him with the strings and pipe,

[5] praise him with the clash of cymbals,
praise him with resounding cymbals.
[6] Let everything that has breath praise the LORD.
Praise the LORD.

This dissertation is dedicated to the memory of my maternal Grandfather: John Wesley "Monk" Gainer. My grandfather was the patriarch of our family. He led his children and guided his entire family towards success in this life. He laid the groundwork for his family to be prosperous. He left a legacy of hard work and its benefits. I know my grandfather would be very proud of this accomplishment. Although this accomplishment is not made through farming (past), it has been made in education (future). I regret that J. W. Gainer is not here to partake in this milestone of my life.

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ABSTRACT

With the cost of intervening being less costly prior to school entry, one strategy being used to decrease the achievement gap is to provide access to quality preschool education for economically disadvantaged children prior to kindergarten entry (Bailet, et al., 2011; Lee, Zhai, Brooks-Gunn, & Han, 2014). The purpose of this study was to determine the effects of a district's prekindergarten program on kindergarten emergent literacy skills as measured by Primary-Measure of Academic Progress. The population for this study consisted of 275 students who attended the district's voluntary prekindergarten program and 724 prekindergarten students who did not attend the district's voluntary kindergarten program. The study utilized the Annual Measurement Objectives (AMO) used by the Tennessee Department of Education to identify the subgroup comparisons. The emergent literacy skills were measured in September, January, and April. The subgroup's RIT scores were compared to determine if a statistically significant difference was present between the achievement levels of the two group comparison. This casual comparative study used a multivariate analysis (MANOVA) to test each of the eleven null hypotheses at the .05 level of significance. The results found that economics were a key factor in determining significance. Attending the voluntary prekindergarten program did not have a statistically significant effect on economically disadvantaged students' academic performance when compared to like peers or non-economically disadvantaged students. The results did show continued growth between each of the three administration of the assessments by all students. As a result, research should be continued to determine if prekindergarten is a viable solution to closing the achievement gap that exists prior to formal school entry.

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CHAPTER ONE: INTRODUCTION

Background of the Problem

Prior to the publication of *A Nation at Risk* in 1983, educational decisions were being made at a local level. As a result of the publication which blamed the economic decline on education, the business community along with government called for uniform policies in education that focused on raising academic standards, implementation of standardized tests, and accountability of teachers and students (Hursh, 2005). In 1989, an national educational summit was held to develop national performance goals to be implemented by the year 2000. The first goal stated that, "All students will start school ready to learn" (National Education Goals Panel, 2002, p.2).

The concept of school readiness (ready to learn) has taken on multiple meanings in recent years as the academic demands of students continue to increase. One view of school readiness refers to chronological age of a student (i.e., physiological and psychological growth) which implies that most children by a certain age enter school and progress adequately. Another view of school readiness constitutes that maturation is an internal mechanism that cannot be altered and if left alone a child will independently show signs of school readiness. Other views have an emphasis on the experiences that a child encounters such as the following: (a) Ausubel (1962) stated readiness depends on maturation, growth, and social experiences of a child (b) Vygotsky (1978) stated readiness function of tasks that can be learned with adult collaboration or more knowledgeable peers (c) Gagne (1985) stated readiness is the availability of competences and necessary skills of a learner that are accessible (Gredler, 1992).

Accountability in education began gaining momentum in the early 1990s as a result of the summit and other legislation. School systems and states had their own individual accountability measures in place. The 1994 reauthorization of the Elementary Secondary Education Act known as Improving America schools became the first nationally used accountability system for school systems. The 2001 reauthorization of the Elementary Secondary Education Act known as No Child Left Behind Act (NCLB) placed significant accountability measures not only on states and school systems but burrowed down to school level accountability. The goal of NCLB was to raise student achievement and close achievement gaps between high and low performing students. No Child Left Behind looked at individual achievement of every student in public education beginning at Grade 3 using state assessments to determine student achievement and growth in reading and math.

Results of the nation's report card, or the National Achievement of Education Progress (NAEP), continue to show significant gaps between the different socio-economic groups. With more than 40 years of government intervention to close the achievement gap, there has been little success. As the government looked to identify other means of closing the achievement gap, studies were conducted on students beginning in kindergarten to track their progress. Studies found that the achievement gap was present upon students entering kindergarten and continued to grow each subsequent year (Wang, 2008).

The years prior to entering kindergarten are regarded as crucial years for emergent literacy. The developmental level and set of skills of students entering formal schooling are a cumulous reflection of their surroundings inside and outside of the home (Chazan-

Cohen, & Kisker, 2013). These experiences have a profound effect on language and literacy which has been identified as the foundation of all learning. Formal schooling enhances the development and set of skills with which students enter (Crim, et al., 2008). Research has found that children who enter kindergarten with gaps in the foundational skills needed for reading tend to remain behind their peers and these literacy struggles in elementary school are predictors of underdeveloped literacy skills throughout their school years and adulthood (Bailet, Repper, Murphy, Piasta, & Zettler-Greeley, 2011; Froiland, Powell, Diamond, & Claire Son, 2013; Gettinger & Stoiber, 2012).

As accountability increases, there is a growing sense of urgency to intervene for "at-risk students" prior to kindergarten entry. Head Start was an initiative by President Johnson to combat the war on poverty. Its goal was to increase the likelihood of school readiness for children living in poverty. One strategy being used to decrease the achievement gap is to provide access to quality preschool education for economically disadvantaged children prior to kindergarten entry. The cost of closing the gap prior to school entry is less costly than intervening during school-age years (Bailet, et al., 2011; Lee, Zhai, Brooks-Gunn, & Han, 2014).

Across the country there is a realization that education reform upon entering the K-12 education system is too late to intervene and make significant change in the achievement gap that exists prior to school entry. As public schools face the calls from the public and government to produce a product that benefits society, implementation of prekindergarten is emerging as a viable strategy to promote school readiness and close the achievement gap (O'Brien & Dervarics, 2007). In the past decade a dozen states have added prekindergarten classes to the traditionally mandated K-12 education to improve

the literacy acquisition of children determined to be at-risk. The passage of No Child Left Behind (2002) and the Good Start, Grow Smart Initiative (2002) are two examples of the federal government's recent recognition of the need to intervene prior to formal schooling (Bingham & Terry, 2013; Dillon, 2008).

Problem Statement

According to the National Center of Education Statistics 2001, reports from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) continue to find disparities between different racial groups. Cognitive scores of children prior to entering kindergarten who fall into the higher socio-economic brackets tend to be 60% above those of children in the lower income brackets. The races that tend to fall in lower income brackets are black children and Hispanic children (Portes, 2005). As early as the Coleman Report 1966, the differences in achievement between white children and children of minority races ranged from half a standard deviation to one standard deviation. One standard deviation meant that 85% of students falling into minority categories scored below the scores of their white counterparts. One of the inferences drawn from the data is that minority children began school with educational deficiencies (Coleman, 1966).

Children neither begin school nor end education with level footing, but in the United States we hold schools accountable for equalizing the social inequalities of all student regardless of family background, racial, ethnicity, or gender. The success of a society has two measures: the literacy level of its children and the disparities that exist in the literacy skills among the children. These measures indicate how investments within the last decade are translated into skills and competencies of the current generation (Keating & Hertzman, 1999).

Reading is an essential life skill needed to be successful in our society. The ability to read provides opportunities for social and economic advancements. Knowing the advantages that literacy affords an individual, the alarm should be sounding with the significant number of children have difficulties learning to read. These struggles are more prevalently seen in poor children, among non-white children, and children whose native language is not English. With this knowledge at hand, the need to support high-quality preschool is a necessity to support reading success (Snow, Burns, & Griffin, 1998).

Purpose of the Study

The purpose of the study was to determine the effects of a district's prekindergarten programs on the kindergarten literacy skills of those who attended as measured by Primary-Measure of Academic Progress. Determining the effectiveness of the prekindergarten program on equipping students with the literacy skills needed upon kindergarten entry will add to the existing literature that allows states to advocate support for the prekindergarten initiatives.

The state Annual Measurement Objectives (AMO) will be used to disaggregate data comparing the literacy skills of those students who attended the district's prekindergarten program to those students who did not attend the district's prekindergarten program to determine if a literacy gap exists in kindergarten. Student groups are determined by the state of Tennessee's Department of Education AMO's which includes ethnicity, race, socio-economics, special education, and English-Language- Learners (ELL). The NWEA was administered in September (fall), January (winter), and April (spring) of the 2014-2015 academic year. The test measures foundational skills (phonics and word recognition, phonological awareness and print

concepts), language and writing (capitalization, spelling, punctuation, language, and writing), literature and informational text (key ideas, details, craft and structure), and vocabulary use and functions (context clues, references, vocabulary acquisition, and use). Student's RIT scores will be used determine if a literacy gap exists between the different student groups.

Significance of the Study

Inequality in education begins prior to formal schooling. The significance of this study lies within its potential to contribute to the body of literature on the effect of public school prekindergarten programs on the literacy gap among students entering kindergarten. The prekindergarten program studied targeted those students who are identified as "at-risk." "At-risk" students begin school with lower cognitive skills than their peers.

Knowledge that an academic gap exists between students based on ethnic divides and socio-economic status warrants studies to determine the effect of early intervention. The earlier intervention starts, the more effective the interventions tends to be. Children's brain structures are shaped at an early age by experiences in their day-to-day interactions. These interactions have a lasting effect on future cognitive developments (Fogarty, 2009; Lally, 2010; Schore 2005). From birth to age three foundations are being laid for future language and intellectual development. With an understanding that literacy is a process, providing an environment that stimulates and promotes literacy and the predictors of later literacy achievement is crucial for students who are identified as "at-risk" (Fogarty, 2005; Lee & Burkam, 2002).

This study added to the literature by looking at the gaps between different ethnic groups and among the same ethnic group by identifying students who attended voluntary prekindergarten and those who did not attend voluntary prekindergarten. The vast majority of studies that have been completed identified gaps between different ethnic groups and socio-economic groups. The ethnic groups studied have typically been African-Americans and Caucasian-Americans with a smaller body of research that included the Hispanic population (Magnuson, Lahaie, & Waldfogel, 2006). This study used the state of Tennessee's Annual Measurement Outcomes to disaggregate the data.

Primary Research Questions

1. Is there a statistically significant difference in the emergent literacy skills of students who attended voluntary prekindergarten compared to the emergent literacy skills of students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment?
2. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment?
3. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment?

4. Is there a statistically significant difference in the emergent literacy skills of African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment?
5. Is there a statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of Non-Hispanic/Latino students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment?
6. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten when compared to the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment?
7. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Caucasian students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment?
8. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged African-American students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment?

9. Is there a statistically significant difference in the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment?
10. Is there a statistically significant difference in the emergent literacy skills of ELL students who did not attend voluntary prekindergarten and the emergent literacy skills of ELL students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment?
11. Is there a statistically significant difference in the emergent literacy skills of special education students who did not attend voluntary prekindergarten and the emergent literacy skills of special education students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment?

The following null hypotheses were derived from the research questions:

Hypotheses:

1. There is no statistically significant difference in the emergent literacy skills between students who attend voluntary prekindergarten and those who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
2. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

3. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
4. There is no statistically significant difference in the emergent literacy skills of African American students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
5. There is no statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of Non-Hispanic/Latino students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
6. There is no statistically significant difference between in the emergent literacy skills of economically disadvantaged Caucasians students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten.
7. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Caucasian students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

8. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged African-American students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
9. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
10. There is no statistically significant difference in the emergent literacy skills of ELL students who did not attend voluntary prekindergarten and the emergent literacy skills of ELL students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
11. There is no statistically significant difference in the emergent literacy skills of special education students who did not attend voluntary prekindergarten and the emergent literacy skills of special education students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Theoretical Framework

The first years of life are vital in shaping the fundamental learning structures of an infant's brain. Lally (2010) suggested that the brain's structure is developed positively or negatively depending upon the daily environment of a baby. Brain structures that influence learning are developed by age two. The social and emotional exchanges that

take place in the first two years of life are the building blocks for learning. The social environment created by the primary caregivers of an infant has a lasting effect on future development and learning (Schore, 2005). Human development begins with dependence upon a caregiver that will provide numerous experiences. Individuals begin new experiences dependent upon others with more experience and later increase their individual responsibility for learning. Vygotsky's theory emphasized the social interaction in human development (John-Steiner & Mahn, 1996).

Cognitive structures are the basic mental processes individuals use to gather, organize, and process information. These structures are categorized into three symbiotic categories: comparative thinking, symbolic representations, and logical reasoning.

These cognitive structures cannot be taught but they are developed through environmental exposure whether implicit or explicit. As these cognitive structures are developed an interactive cycle of learning is being developed. "Learning is created by the learner and generates its own energy that reinforces itself through a cycle of ongoing creativity and change (Garner, 2007, p. XV)." Individuals must interact with learning in order to construct personal meaning with the information being filtered or no learning will take place.

Comparative thinking structures process information by comparing and contrasting information that is represented. The components of this structure are: recognition, memorization, conservation of constancies, classification, spatial orientation, temporal orientation, and metaphorical thinking. These structures are prerequisites for students to move along the learning continuum toward symbolic representations and logical reasoning.

As mediators, it is important to be aware of the cognitive structures and their importance in the academic environment. Although individuals may not come with structures developed, mediators have the ability to enhance these structures by providing opportunities that stimulate reflective awareness and visualization. Regardless of age, cognitive structures can be developed with the appropriate environmental stimuli. When individuals become reflectively aware of their environment and senses, the stronger their cognitive structures become.

Cognitive structures help individuals make connections with new knowledge to their existing schema so that learning becomes meaningful. Mediators must provide opportunities that stimulate the schema of an individual. No connections are discriminated against because each connection is unique to each individual's personal experience. As learning is based on connections and relationships, it is important to allow individuals to explore their current depth of knowledge and make relevant connections to the new information. When individuals are able to formulate rules for processing information, the organization of information becomes faster and predictable (Garner, 2007).

Vygotsky believed that in order to understand an individual's cognitive development, references must be drawn from their social and cultural context. This theoretical framework rejected the idea that child development could be defined by stages based on single characteristics. He believed that social processes were the origin to higher mental processes in an individual. He also believed that biological and cultural development do not occur in the absence of one another (Driscoll, 2005). Wertsch (1985) identified three themes as the basic core of Vygotsky's theoretical framework:

> (1) a reliance on the genetic or developmental method; (2) the claim that higher mental processes in the individual have their origin in social processes; (3) the claim that mental processes can be understood only if we understand the tools and signs that mediate them (pp. 14-15).

The Vygotskian approach emphasizes the important role that sociocultural forces played in crafting a child's development and learning. It identifies the significant role of the adults and peers in a child's community in defining the types of environmental interactions that are experienced. Mediation and psychological tools emerged as two concepts for identifying the agency of learning. Kozulin, Gindis, Ageyev, and Miller (2003) defined mediation as the role played by man and barriers that exist between the learner and the content to be learned. Psychological tools are culture specific symbols that a learner internalizes and uses as their cognitive tool. Wertsch (1994) described Vygotsky's mediation as

> The key in his approach is understanding how human mental functioning is tied to cultural, institutional, and historical settings since these settings shape and provide the cultural tools that are mastered by individuals to form this functioning. In this approach, the mediational means are what might be termed the "carriers" of sociocultural patterns and knowledge. (p. 204)

Adult mediation facilitates the learning and development in children. Activities should be developmental appropriate for the skill needed to be acquired. Children's learning and development are not contingent upon heredity, conditioning, nor the result of independent exploration. The new tools gathered from adult mediation result in new abilities, mental processes, and motives in children (Karpov, 2014).

Another distinctive feature of Vygotsky's theory is the idea that higher mental processing originates from social relationships in one's environment. "Mental processing can only be understood through psychological tools, the linguistic, mathematical, or

cultural signs that mediated them. We can only really understand children's thoughts by a process of trying to understand their gestures, pictures and words" (Whitehead, 1997, p. 60). Culture is responsible for developing their language and other symbolic systems used as psychological tools to process information.

Vygotsky's theory is rooted in the sociocultural theory which is based on the belief that individuals adopt concepts, behaviors, and attitudes that are prevalent in their environment. The historical perspective identifies the development of a child as the result of the environment and not an isolated occurrence. Future development is not limited to biology but includes activities and interactions with others. Vygotsky (1981) explained the abilities that make us human "are a copy from social interaction; . . . mental functions are internalized social relationships" (p. 164).

Just as Vygotsky's social theory believes that children are a result of their environment, Piaget's theory of cognitive development also advocates that children are active participant in their environment. Piaget's theory of cognitive development is based on four basic principles: schema, adaptation, equilibration, and the four stages of development. Schema is the cognitive structure present during infancy. It refers to a child's ability to organize and make sense of experiences at a particular time. " Schemas gradually evolve from those in infancy based on actions to those based on representations in early childhood and to those based on internalized, organized operations in middle childhood (Halpenny & Pettersen, 2014, p. 25)." Adaptation refers to a child's ability to acclimate their schema based on their environment. Adaptation is achieved through two mechanisms: assimilation and accommodation. Assimilation refers to a child's ability to perceive new information into their existing schema or operations. Accommodations

refers to the adjustment of schema in order to account for a new experience or new information (Driscoll, 2005; Halpenny & Petterson, 2014).

The continuous cycle of assimilation and adaptation results in equilibration. Equilibration is the movement from one stage of development to the next. Children begin to question their understanding and knowledge of the world and update their schemas using this new knowledge and their experiences. The final principle rest with the four stages of cognitive development: sensorimotor, preoperational, concrete operational, and formal operational. Piaget believed that all children progress through the four stages of development and once a child has moved passed the developmental stage, regression to a previous stage is not possible. All children will pass through the four stages of development but the age at which a child moves through each development stage varies depending on the child's culture. Reaching the formal operations stage is not guaranteed as only a small number of adolescents reach this stage of development (Driscoll, 2005; Gredler, 1992; Halpenny & Petterson, 2014).

Assumptions

Researcher assumptions are:

1. Prekindergarten teachers adhered to scope and sequence of the district curriculum.
2. Current kindergarten teachers adhered to the scope and sequence of the district curriculum.
3. The Primary-Measure of Academic Progress is an appropriate instrument to measure kindergarten literacy skills.

4. Personnel administering the test were adequately trained in setting-up and administering the on-line test.
5. Kindergartener's ability to use a computer will not distort the results.

Limitations

Multiple factors could have affected the validity of the study results follow:

1. The study is limited to an individual school district.
2. Neither the attendance rate of the students while enrolled in prekindergarten nor kindergarten was accounted for.
3. Unknown levels of kindergarteners' experience with a computer.
4. The study only identifies students who attended the prekindergarten program sponsored by the school district.

Delimitations

Delimitations of the study are as follows:

1. The study is limited to a single school district.
2. The study only identifies prekindergarteners who attend the school district's prekindergarten program.
3. The study is limited to kindergartners who completed all three benchmarks.

Definition of Terms

Annual Measurement Objectives (AMO):

"Indicating the minimum percentage of students who must meet the proficiency level of performance on reading and mathematics assessments, and defines subgroups as economically disadvantaged students, students from major racial and ethnic groups, students with disabilities, and students with limited English

proficiency. Each state establishes its own AMO targets and a minimum group size—that is, the minimum percentage of students in each subgroup who are required to meet or exceed the AMO targets (Kim & Sunderman, 2005, p. 3),"

At-Risk Students:

If students have one or more of the following characteristics: (a)low economic status (b)from a single parent family (c) teen mother (d) households without English speakers (e) non-employed parents (f) large family and (g) low parental education (Reynolds, Temple, Robertson & Mann, 2002; Robbins, Stagman, & Smith, 2012).

Early Intervention:

A system of services that usually targets (a) low income (b) academically at-risk preschool-age children (c)children with disabilities in order to increase academic and social outcomes of the children (Thomas, 2008)

Economically Disadvantaged Student:

Economically disadvantaged students are identified by whether they eligible for free or reduced-price lunch under federal guidelines ((Kim & Sunderman, 2005).

ELL Students:

ELL (English Language Learner): an active learner of the English language who may benefit from various types of language support programs. This term is used mainly in the U.S. to describe K–12 students. An English Language Learner (ELL) student is defined as a linguistically and culturally diverse (LCD) student who has an overall English Language Proficiency (ELP) level of 1-4 on the ACCESS for ELLs test administered each year.

http://www.ncte.org/library/NCTEFiles/Resources/PolicyResearch/ELLResearchBrief.pdf.

Emergent Literacy:

The National Early Literacy Panel identified six key predictors for early reading and school success: alphabet knowledge, phonological awareness, rapid automatic naming of letters or numbers, rapid automatic naming of objects or colors, writing, and phonological memory (National Early Literacy Panel, 2008).

Family Risk Factors:

Include family history of reading problems, home literacy environment, verbal interaction, language other than English, nonstandard dialect, and family based socioeconomic status (SES) (Snow, Burns, & Griffin, 1998).

High Quality Prekindergarten:

High quality preschools are prekindergarten classrooms that are determined by two factors: teacher education and classroom quality. Classroom quality is determined by a quality rating system set by the National Institute for Early Education Research (NIEER). The rating system is called the Early Childhood Environment Rating Scale Revised (ECRS-R). The rating scale ranging from 1(poor) to 7(excellent) with 5-points being considered good (Armor, 2014).

Literacy:

"An individual's capacity to understand, use and reflect on written texts, in order to achieve one's goals, to develop one's knowledge and potential and to participate in society (Organization for Economic Co-operation and Development, 2006, p. 46)."

P-MAP:

Measures of Academic Progress® (MAP®) – These computerized tests are adaptive and offered in Reading, Language Usage, and Mathematics. When taking a MAP® test, the difficulty of each question is based on how well a student answers all the previous questions. As the student answers correctly, questions become more difficult. If the student answers incorrectly, the questions become easier. In an optimal test, a student answers approximately half the items correctly and half incorrectly. The final score is an estimate of the student's achievement level (https://www.nwea.org/content/uploads/2014/07/ParentToolkit_0.pdf)

Prekindergarten:

The program gives priority to at-risk children who meet eligibility guidelines for the federal free and reduced lunch programs, and secondarily for students with disabilities and limited English proficiencies (Lipsey, Hofer, Farran, Bilbrey, & Dong, 2012).

The purpose of the program is to expose three and four-year olds to academics and the school environment to enhance student academic and social behaviors prior to kindergarten (Barnett, Hustedt, Robin, & Schulman, 2004).

Reading Readiness:

"Accomplishment of skills presumed to be prerequisite to benefiting from formal reading instructions measured by comparing accomplishments of children in kindergarten where pre-reading skills are practiced with their scores on standardized reading tests in the primary grades" (Snow, Burns, & Griffin, 1998, p. 113)

RIT Score:

RIT Tests developed by NWEA use a scale called RIT to measure student achievement and growth. RIT stands for Rasch UnIT, which is a measurement scale developed to simplify the interpretation of test scores. The RIT score relates directly to the curriculum scale in each subject area. It is an equal-interval scale, like feet and inches, so scores can be added together to calculate accurate class or school averages. RIT scores range from about 100 to 300. Students typically start at the 180 to 200 level in the third grade and progress to the 220 to 260 level by high school. RIT scores make it possible to follow a student's educational growth from year to year (https://www.nwea.org/content/uploads/2014/07/ParentToolkit_0.pdf).

Socioeconomic Status:

An individual or group's position in society based on occupation, education, income, wealth, or place of residence (Hirsch, Kett, & Trefil, 2002).

Title I Schools:

A school with a percentage of students from low-income families of at least 40 % may use Title I funds, along with other Federal, State, and local funds, to operate a "schoolwide program" to upgrade the instructional program for the whole school (http://www2.ed.gov/programs/titleiparta/index.html).

Summary

The Coleman Report (Coleman et al., 1966) was the first national study to disaggregate data based on ethnic differences identifying an achievement gap between different minority groups and their white counterparts. The study looked at the

relationship between student achievement using achievement test and the depiction of the school attended. The results revealed an increasing achievement gap throughout the years that lead to a 3.3 year academic gap by Grade 12 between black and white students. The Coleman Report began a wave of research that focused on understanding the achievement gap and means of closing the existing gap that was found to exist at school entry (Fryer Jr & Levitt, 2004).

Hart and Risley (1995) studied the vocabulary of children living in different home environments and discovered the vocabularies of those who lived in homes with professional parents possessed a vocabulary that was twice as large as those children living in poverty. Jencks and Phillips (2011) explored the black-white test score gap and found that the gaps that existed in Grade 12 were attributable to those gaps upon school entry. In the text The *Black-White Test Score Gap,* researchers acknowledge the need to close the gap prior to student entry into school and that by intervening prior to school entry at least half of the existing gap would not exist upon completion of twelfth grade. Lee and Burkam (2002) found in their study that students entering kindergarten from low-socioeconomic status scored 60% lower than their students who came from higher socioeconomic backgrounds.

In a 2006 study conducted by Pianta (2007), Pianta found that early childhood education programs had the capacity to alleviate learning gaps if children were able to receive emotional and effective instructional support from teachers. The study looked at two groups of at-risk children. The two groups were made up of students whose parents lacked a four year degree and children identified as having major behavioral, social, or academic problems. At the completion of an effective early childhood education program

the students performed at the same academic levels as typical peers without either of the two groups at-risk indicators. The concern noted in the study is the lack of access to high quality early childhood programs. Nielson and Monson (1996) found that students enrolled in an emergent literacy classroom made significant gains in literacy including students considered to be at-risk. The findings support the need for enriched literacy environments for children and evidence that the age of the child does not reduce the opportunities for academic achievement.

The beginning years of life are crucial years for literacy development. The lack of literacy development in the early years prior to kindergarten entry create gaps in the learning of at-risk students when compared to their more affluent peers. The learning gaps create a deficit that puts a child in the position of entering the classroom playing catch-up. With more than 30% of low-income children entering school with no familiarity to print along with approximately 17% of children from middle-income households, this signifies a need to intervene prior to kindergarten entry. A growing number of middle class students are also unprepared for kindergarten. There is a need to provide high-quality prekindergarten for all students especially those students who are at-risk for academic failure (Doggett & Wat, 2010).

CHAPTER TWO: LITERATURE REVIEW

Introduction

The purpose of the study was to determine the effects of prekindergarten programs on the kindergarten literacy skills as measured by Northwest Education Association (NWEA) generally referred to as Primary-Measure of Academic Progress (P-MAP) within a Mid-Cumberland school system. This study examined if participation in a Mid-Cumberland voluntary prekindergarten program increased literacy achievement of kindergarteners as measured by the P-MAP. Determining the effectiveness of the prekindergarten program on equipping students with the literacy skills needed upon kindergarten entry will assist the school district in advocating for funding from the state for continued support of the prekindergarten initiative.

School readiness has been an issue going back as early as 1898 (Pestalozzi, 1915). The International Kindergarten Union coined the term "reading readiness" during one of their meetings back in 1927. With multiple levels of involvement and commitment from the business community, task forces and legislature, unparalleled attention was placed upon academic competencies of children entering school (Holmes, 1927; Stipek & Ryan, 1997).

Closing the achievement gap among different ethnic and racial groups has been a critical issue faced by United States for more than 60 years. The landmark case, Brown v. Board of Education 1954, followed by the Coleman Report 1966 brought about national attention and government resources being devoted to closing the existing gap. Brown v. Board of Education was a legal attempt toward providing equality in education. Not much later, led by President Lyndon B. Johnson's "War on Poverty", Head Start

began. It was one of the country's first federally funded programs to intervene on behalf of disadvantaged students prior to school-age entry (Ramsey & Ramsey, 2008; Wang, 2008; Ziegler, 2000).

Legislation continued to come forth in an effort to combat the existing achievement gap that continued to persist between socio-economic, ethnic, and racial groups. No Child Left Behind 2001 (NCLB), a reauthorization of the Secondary Education Act of 1965, was a measure that held school systems accountable for the academic success of all students. The goal of NCLB was that all students be proficient in math and reading by 2013-2014. The United States continues to legislate achievement in schools through policy as there is a need to ensure the education of the nation's children (Neuman 2003; Ziegler 2000). Rust (2003) stated:

> Policy emerges from need. It is a response to a problem. The value and appropriateness of a policy depend on the underlying assumptions and intent of those who frame it and the extent to which the policy defines the problem correctly (p. 154).

Three major trends continue to direct the country's focus on early education of children, (a) the continued public demand for quality childcare as more women are entering the workforce, (b) consensus that educational experiences should be provided to children, and (c) the research supporting the academic capabilities of young children and the positive effects on future achievements (Bowman, Donavan, & Burns, 2000). With these trends looming, school readiness regained national attention in 1991 with the establishment of National Education Goals. The first goal being that children in this country will begin school ready to learn. School readiness was identified by the following dimensions: language acquisition, cognitive skill and motivation, physical and motor

development, and socio-emotional development (Weis, 1991; Wesley & Buysee 2003; Winsler et al. 2008).

"Growing recognition that efforts to reduce the achievement gap must start before children enter kindergarten is driving renewed interest in universal preschool (Ashford, 2007, p.22)." Children of color represent the majority of children under age one. By 2043, these children will represent the majority population. With knowledge of the current achievement gaps existing between blacks, Hispanic, and Asian children when compared to white children, a shift in the mind-set of education must occur. Lee and Burkam's (2002) found that at kindergarten entry a 60% cognitive disparity exists between students of high socioeconomic status when compared to students of low economic status. Magnuson, Waldfogel and Ruhm (2007) conducted a study and found that participation in prekindergarten programs produced significantly higher cognitive scores upon kindergarten entry. The findings also revealed longer-lasting results for children in poverty. With multiple decades of research on early intervention, research has revealed that short term cognitive development and school achievement enhance competencies over an extensive period of time but recognizes that these interventions are often shortened due to the inferior schools attended by children living in poverty (Reynolds & Temple, 1998).

Literacy is an important aspect of educational success for all students. Students who are at-risk for reading failure are also at-risk for academic failures throughout school. Literacy begins in the home long before entering formal education. The literacy climate of the home determines the experiences and exposure received by the individuals in the environment. Rich experiences promote positive literacy experiences and

positively impact future learning. Poor experiences allow illiteracy to begin much earlier in life. The building block of literacy, vocabulary, is indispensable to the successes in reading and writing. The vocabulary experience of a child at age four living in poverty will possibly experience 13 million less words than a child being reared in a working class family (Hart & Risley, 1995).

A child's literacy concepts are formed during the earlier years of life by observing and interacting with readers, writers, and their own attempts at reading and writing. The ability to use symbols is gradually acquired as children attempt to interpret symbolic representations. Learning to read is a lengthy process with multiple prerequisites that are essential to literacy. Individuals learn the pragmatics of language well into adulthood. Failure to experience and develop adequate vocabulary, phonemic awareness, and print concepts during preschool years increases the likelihood of reading difficulties. The lack of vocabulary slows down the speed at which vocabulary is added to a child's word bank. This vocabulary gap even with exposure is likely to widen with experiences because the child will play catch-up to students who entered education with the experiences they will have to be taught (Snow, Burns, & Griffin 1998).

Development of reading and writing skills between infancy and age five have shown a consistently positive correlation with later reading skills. The National Institute for Literacy (2008) identified six variables as precursor literacy skills. Alphabetic principle, phonological awareness, rapid automatic naming of letters or digits, rapid automatic naming of objects or colors, writing or writing name, and phonological memory are six key variables that maintained their predictive power when accounting for other factors such socioeconomic status. The combination of these skills build the

foundation for success in literacy. The earlier the skills are developed the more efficiently additional skills can be cultured (Missall et al., 2007; Snow et al., 1998).

Pioneer Studies

Four historical research studies are usually cited as evidence of the effectiveness of quality intervention programs prior to school-age entry. They are the Early Training Project (1962) in Murfreesboro, TN, High/Scope Perry Preschool Project (1960) in Michigan, the Abecedarian Project which began in 1972 in North Carolina, and the Chicago Child Parent Centers which began in 1967.

Early Training Project

The Early Training Project conducted in Murfreesboro, Tennessee, ran from 1962 through 1965. The project participants were 65 African-American children from low-income families residing in Murfreesboro and 27 children living in a nearby town. The goal of the project was to improve academic potential and produce intrinsic motivation to succeed. Children were randomly assigned into intervention groups that met consecutively for two or three summers or a control group which received no instruction. In addition to the control and experimental group a distal group of 27 was identified in a nearby town with similar demographics. Those in the treatment group received a 10-week preschool program during the summer, weekly home visits, and nine-months of parental training. Participants were assessed in 1965, 1966, 1968, 1975, and 1978 (ages 7-19). Results of assessment found a significantly higher IQ within the treatment group when compared to the control group (Anderson, 2008; Currie, 2001; Klaus & Gray, 1968; Stevens, 1982; Thomas, 2008). The distal group's IQ scores were the lowest of the four groups (Klaus & Gray, 1968). Anderson (2008) does not include the distal group findings

in his reflections on the Early Training Project because participants were not randomly assigned and demographics were not similar to those of the control group.

Thomas (2008) concluded from the results that the treatment group scored higher but by the fourth grade the academic gap closed with the treatment group no longer outscoring the control group. The final analysis of the results concluded that there were no lasting difference between the IQs of the two groups but the intervention reduced the number of students being placed into special education, retention rates and dropout rates. Stevens (1982) in contrast to Thomas (2008) concluded that significant differences in IQ remained at the end of fourth grade. When students were tested in high school, there were no significant differences in IQ between the experimental and control group.

High Scope Perry Project

High/Scope Perry Preschool Project was a 1960 study of 123 underprivileged black children between the ages of three to four who were random selected by the flip of a coin to receive treatment (prekindergarten) or non-treatment (no prekindergarten). The study was highly funded in comparison to other Head Start programs operating during the time period (Currie & Thomas, 2007). Participants were chosen using a census of families attending the Perry County Schools, neighborhood group referrals, and door-to-door canvasing. The targeted population were black parents (which represented the majority of the Perry School neighborhood). At-risk in this study was identified as low-socioeconomic status, incomplete education, household size compared to the number of rooms in the house, and occupation. Children were given the Stanford-Binet Intelligence Test to determine IQ levels. Selection process identified only students whose IQ fell in the range of 70 to 85. Students were paired according to IQ results and placed in alternate

groups (Schweinhart, 2003; Weikart, 1998; Wilson, 2000). Anderson's (2005) findings disputed the randomization of children being paired by IQ.

From 1962 to 1965, five successive classes entered annually in the fall. Children entered between the ages of three to four. Whereas the control group received no program, the treatment group received 2 ½ to 3 hours of instruction five days a week and 1 ½ hour home visits each week. Parents of the control group also met monthly with parents of children in the experimental group and program staff. Data was collected annual on both groups from age three to eleven, and at ages 14, 15, 19, and at age 27 (Anderson, 2005; Anderson, 2008; Currie, 2001; Schweinhart, 2003; Thomas, 2008; Weikart 1998; Wilson 2000) and again at age 39-41 (Schweinhart, 2003). Thomas (2008) stated that up to age 14, children in the treated group continued to score higher than those who did not receive the treatment. The study tracked the progress of both groups into adulthood and acknowledged the following findings:

- Special education (15% vs. 34%)
- Female special education (8% vs. 37%)
- Graduation rate (65% vs. 45%)
- Female baring children out-of-wedlock (57% vs. 83%)
- Male home ownership (52% vs. 21%)
- Male higher monthly income at age 27 (42% vs. 6%)

The positive effects extended well into adulthood based on continuous data collection (Currie &Thomas, 2000; O'Brien & Dervarics, 2007; Schweinhart, Barnes, Weikart, Barnett, & Epstein, 1993). The High Scope Perry Project was identified as having the most positive long-term effect of studied preschool projects of disadvantaged children

(Lee, Brooks- Gunn, Schnur, & Liaw, 1990). It is also most often cited due to randomization of participant selection and long-term follow-up of participants (Cobb, 2008).

The Abecedarian Project

The Abecedarian Project ran from 1972-1985. It sought to determine whether intensive and high-quality early intervention programs could prevent mental retardation caused by inadequate environments and to explain how biological and psychological processes are affected by preventative measures (Ramey et al., 1976; Campbell, Ramey, Pungello, Sparling & Miller-Johnson, 2002; Ramey & Ramey, 1994). The primary source for subjects of the Abecedarian Project were referred by North Carolina Memorial Hospital (teaching hospital). Referred mothers were interviewed to rate them on a "High-Risk Index" which was based on 13 sociodemographic factors (Campbell et al., 2002). Fifty-nine families were offered membership with 58 accepting. Children entered the program from six-weeks to three-months of age (Anderson, 2005; Anderson, 2008; Cobb, 2008; Currie, 2001; Ramey et al., 1976).

Families were placed in experimental and control groups. Both groups received family support social services, nutritional supplements, medical care, transportation for project participation, payment for participation, and disposable diapers. Whereas the experimental group received a planned curriculum administered daily for 50 weeks out of the year from birth to age five, the control group were home-reared or attended other child care centers (Anderson, 2005; Anderson, 2008; Campbell et al., 2002; Currie, 2001; Ramey et al., 1976). During the first two years, the program recruited 14 members for the control and the experimental group. A total of 109 families (represented 111 children)

agreed to partake in the study (Campbell et al., 2002; Currie, 2001; Ramey & Ramey, 1994).

The Bayley Scale of Infant Development was the primary instrument used to measure cognitive abilities every three months during the first year and semiannually for subsequent tests until more appropriate instruments were made available. The children were monitored from infancy till kindergarten entry and half of the children for the first three years of their public education. Upon school entry, children were again randomly placed into two groups. One group received no further intervention while the other group was monitored for the first three years of public education and assigned a home school teacher (HST). The HST was a liaison between the home and the school. She meet with the teacher and parents bi-weekly to increase parental involvement and provide parents with curriculum practices (Campbell et al., 2002; Currie, 2001; Ramey & Ramey, 1994). Whereas only 24% of the treatment group received special education services, 48% of the control group received special education services. Sixteen percent more of the treatment group graduated from high school with 36% having attended a four-year college, double the rate of the non-treatment group. The study followed its participants till age twenty-one (Campbell et al., 2002; O'Brien & Dervarics, 2007; Ramey & Ramey, 1994).

Chicago Child-Parent Centers

Chicago Child-Parent Centers (CPC) began in 1967 and continue to operate in the low-income neighborhoods of Chicago today. The Chicago Longitudinal Study (CLS) began collecting annual data with a cohort of 1,539 children born in 1980 at the respective ages of five and six. The CLS is the oldest running extended early intervention program and the second oldest federally funded program. The preschool group consisted

of 989 children who completed preschool and kindergarten in one of twenty of Chicago's Child-Parent Centers. The comparison group consisted of 550 children who did not attend preschool but completed kindergarten in one of the five randomly selected CPCs (Niles & Peck, 2008; Reynolds, 1997; Reynolds, Temple, Robertson, & Mann, 2002). The comparison group was comprised of 27 randomly selected sites that participated in the Chicago Effective Schools Project (CESP) (Niles & Peck, 2008).Within the comparison group, 14.8% of the children attended (Reynolds et al., 2002) Head Start and the remaining children had no preschool experience.

Eligibility for the study required residency in a Title I school attendance area, living in poverty, and parental agreement. Children entered the program between the ages of three to four. Study participants remained eligible for services up to age nine. The study made three comparison (a) the preschool group of students to the remaining students in the study (b) those students receiving school-aged program for at least a year to those not participating regardless of preschool activity and (c) effect of extended intervention by comparing students who had begun in preschool and continued with the school-age program to all other children remaining in the study (Reynolds, 1997; Reynolds et al., 2002). Preschool participants' results revealed 41% fewer special education placements, 40% fewer retentions, and a 20% increase in graduation rate by age 20. School-age participants had a greater school achievement rate at 9 and 15, remedial services reduced by 18%, reduction in special education by 28%, and reduction in retention of 31%. Lastly, the extended program participants had academic achievement throughout, a 35% reduction in special education services and no statistically significant difference in graduation rate (O'Brien & Dervarics, 2007;

Reynolds, 1997; Reynolds et al., 2002). Those students participating in the follow-up interventions for two to three years demonstrated a six-month reading and math advantage in achievement in the second and third grade. The extended intervention was associated more with academic achievement and lower retention rates than the timing of the intervention being given (Reynolds & Temple, 1998).

Reynolds and Temple (1998) did a follow-up study of the CPC to determine the effect of the intervention at age 13 using the Iowa Test of Basic Skills (ITBS) for reading comprehension and math. The children who received the extended intervention for two to three years outperformed those students whose intervention ended at kindergarten entry. At age 13, the students' scores were within range of the average Chicago student in reading and math.

Summary of Historical Studies

The Chicago-Parent Center preschool differed from the Early Training Project, High/Scope Perry, and the Abecedarian Project because the subjects were not randomly assigned to treatment groups. The Chicago study did use a similar approach to the Early Training Project to create comparison groups to determine the effects of the intervention (Anderson, 2008; Cobb, 2008). The length of the interventions varied from a 10-week summer program (Early Training Project) to 50-week intervention (Abecedarian Project) (Thomas, 2008). The experimental samples in all but the CPC were so small that the statistical power of the results were limited. All four projects yielded significant results in the reduction of special education, retention, and dropout rates of participants. All but the Early Training Project were longitudinal studies which identified positive results into adulthood including lower pregnancy rates, crime rates, etc. (Barnett, & Epstein, 1993;

Campbell et al., 2002; Currie &Thomas, 2000; O'Brien & Dervarics, 2007; Schweinhart, Barnes, Weikart, Ramey & Ramey, 1994).

Contemporary Experimental Studies

Head Start Impact Study

With the reauthorization of Head Start in 1998, Congress mandated that the U. S. Department of Health and Human Services determine the effect of the Head Start program (Puma et al., 2014). Head Start is a program aimed at disadvantaged children. It provides preschool education, medical, dental, mental health care, nutrition services, and services for parents (Isaacs & Roessel, 2008). Puma et al. (2014) identified the following questions to be answered by the Head Start Impact Study (HSIS): effects of Head Start on key learning and development outcomes for low income children, effects on parental practices contributing to school readiness, circumstances under which Head Start has the greatest impact, effects on the different groups of children, and the most effective services related to greatest impact.

The Impact Study began with a cohort of 4,500 children who were either three or four years old in the fall of 2002. Of the 4,500 children, 2,600 were randomly assigned to one of the 300 Head Start centers in over 23 states. The remaining 1,800 were assigned to the control group. Some of those assigned to the Head Start program did not attend and some of those who would have been in the control group sought other preschool opportunities (Armor, 2014).

The results yielded that four-year-olds with only one year of Head Start gained significantly in literacy and language with a standard deviation of .09 to .31 as compared to the control group (Duncan & Magnuson, 2013). Three-year-olds who experienced two

years of Head Start finished the first year with a seven-point advantage which represented 3.5 month advantage and the advantage shrank to five-points during the second year which represented a two month advantage. Both years were statistically significant when compared to the control group. During the kindergarten year, both the control and experimental group scored the same and at the end of the first grade year the control group outscored the experimental group by two-points. Although the difference in first grade is not statistically significant, it questions the effect of Head Start on the experimental group. The Head Start single digit gains are marginalized by the 40-point growth that is measured annually for each cohort upon entering regular school. The effects may be offset due to the major development years in primary grades (Armor, 2014).

Students enrolled in Head Start fell below national norms for school readiness, although the achievement gaps for letter recognition was cut by 45% and pre-writing skills by 25% (Isaacs & Roessel, 2008). Currie and Thomas (2000) and Lee and Loeb (1995) suggested the low-quality of schooling the cohorts enter erase the effects of Head Start. Preschool cannot immunize the cohorts from subsequent schooling.

Early Head Start

Early Head Start (EHS) is an extension of Head Start which began in 1994. "The program promotes healthy prenatal outcomes; cognitive and language development and socio-emotional well-being of infants and toddlers; and family development and a supportive parent-child relationship (Isaacs & Roessel, 2008, p. 14)." The program targets the prenatal period until age three (Armor, 2014).

The evaluation of EHS involved a randomly assigned cohort of 3,000 children and their families who began the program between 1996 and 1998. The cohorts were evaluated at age three, five, and fifth grade. The experimental group outscored the control group on standardized assessments of language and cognitive development. Although the experimental group outscored the control group the scores for both groups were below the national norms and remained in the at-risk range (Isaacs & Roessel, 2008). Visible differences at age two and three were no longer significant at age five (Vogel, Brooks-Gunn, Martin & Klute, 2013). The impact of EHS at the end of fifth grade, showed no overall effects on cognitive performance between the cohorts (Armor 2014).

Voluntary Pre-K for Tennessee Initiative

The voluntary program began in 2005 with priority status given to children in poverty, children with disabilities, and children with limited English proficiency. The teachers in the classroom were certified. Class sizes were limited to 1:10 adult-student ratio which leads to most classrooms having an educational assistant. The program ran five days a week with a minimum of 5.5 hours daily (Armor, 2014; Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011).

Lipsey, Farran, Bilbrey, Hofer, and Dong (2011) stated that the Tennessee Voluntary Pre-K (TN-VPK) began as a pilot in 1998 and became fully operational in 2005 with state funding. It was a full-day program for children who would enter kindergarten the next year. Priority enrollment was given to students living in poverty, students with disabilities, and English as a second language students. The purpose of the program was to answer the same questions as the Head Start Impact Study looking at TN-

VPK. The program assessed the cohort of students who entered during the 2009-2010 academic year.

A random sample of 23 schools in 14 school districts were selected. Nine hundred seven participants were placed in the control or experimental group. To gain consent for testing from parents, letters were mailed. Obsolete addresses, inattention of parents to return consent, and lack of personal contact with parents led to a low consent rate of 342 eligible children. Overall consent rate was 38% of the 907 participants. Due to lack of communication with parents the control group and experimental groups were compromised. Students who were originally in the control were shifted to the experimental. Baseline data was now critical to the validity of the study (Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011).

All students were administered the Woodcock Johnson III Achievement Battery by a member of the research team on site or for the control at a convenient location for the parents. Only 86% of the 342 subjects were assessed. Three students left the program prior to the end of the year leaving only 303 students (230 experimental and 73 control). The cohort demographics contained 53% White, 27% Black, 20% Hispanic with 32% of the cohort speaking a language other than English at home. Within the control group 12% attended Head Start, 26% attended private childcare centers, 51% stayed at home with a guardian, and 11% of arrangements were not made available (Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011).

The statistical significance was tested at alpha = .10 although the results report the conventional .05 level. The alpha was changed due to the sample size and the need to reduce the control group size more to match propensity scores. The results showed an

effect size of .28 to .42 with the largest effect being in Letter-Word Identification in favor of the experimental group. Most of the skills tested with language identified as having had the greatest gains for the Pre-k cohort ranged from 37% to 176% with an average of 93% (Lipsey, Farran, Bilbrey, Hofer, & Dong, 2011).

Armor (2014) found different results when compared to the Vanderbilt research report by Lipsey, Farran, Bilbrey, Hofer, and Dong (2011). Armor's (2014) research contained information on two cohorts from the study which was not yet available in 2011. Armor (2014) stated an experimental design was used to randomly assign 3,000 children into the control and treatment groups during the 2009-2010 and 2010-2011 academic years. Eleven hundred were chosen for the treatment group. With permission being sought for testing after random assignment, enrollment in the control group went down. With the difference in the participation rates between the control and the treatment group the study was no longer classified as randomized controlled but rather a quasi-experiment. The results yielded 2.5 months of learning in comparison to the control group. Evaluation at the kindergarten and first grade follow-ups revealed the impacts were no longer present. Results yielded a 2%-4% increase in kindergarten retention for the control group. Tennessee's results were similar to those found in the Head Start evaluation. During preschool the benefits were significant but upon regular school entry the significance faded and both cohorts were equal.

Recent Studies of Early Intervention

Missall et al. (2007) conducted a study to measure early literacy from preschool through first grade for students enrolled in a preschool program run by the local school district. The purpose of the study was to determine the link between early literacy

measures (preschool) and later reading skills (first grade). The participants were identified as at-risk due to close proximity to low performing, high poverty elementary schools. Almost 60% of the participants were eligible for free or reduced lunch. The sample excluded students who were eligible for special education. The Early Literacy Individual Growth and Development Indicators (EL-IGDIs) assessment was administered to preschoolers and kindergarteners for two subsequent years in the fall, winter and spring. Although the findings only discuss measures for early literacy and reading, the assessment includes measures for mathematics and literacy. During their subsequent kindergarten and first grade year, a curriculum-based measurement data assessment was administered during the fall and spring. Of the 143 participants, only 116 remained in the school district through first grade.

The results found that the preschool EL-IGDIs were predictive measures of oral reading fluency in kindergarten and first grade. The picture naming, administered in the fall of the preschool year, accurately depicts the first grade reading fluency with a 72.7% accuracy. Results also conclude that preschoolers who were unable to answer any rhyming questions were low readers at the end of kindergarten and remained low at the end of first grade.

Research conducted by Winsler et al. (2008) sought to determine school readiness in ethnically and linguistically diverse children in poverty by comparing results to national norms. The study looked at the effects of three types of preschool: children receiving subsidies to attend center-based care, Title I public school pre-k, and fee supported public school pre-k. The Learning Accomplishment Profile Diagnostic (LAP-D) was administered to the prekindergarteners at the beginning and end of the academic

year. Cognitive and language skills were two of the four skills assessed by the assessment.

Findings of the research, center-based care began the year at the 40th percentile and ranked nationally by the end of the year. Despite starting the year lower than the national norms, Title I public school pre-k end the year as high as the 63rd percentile. Entering and ending the year above both groups, fee-supported public school pre-k made significant gains in their achievement. Looking at students in poverty, children attending Title I public school pre-k showed significantly more growth than students attending community-based childcare. The curricula taught in the Title I schools are aligned with language and cognition development assessed by the LAP-D.

Wang (2008) examined the extent of the achievement gap among prekindergarten students of different ethnic and racial subgroups. The study used the Early Childhood Longitudinal Study Birth Cohort (ECLS-B), an existing data bank that used a national representative sample of U.S. four year old. Wang (2008) examined statistical and practical significance of the achievement gaps between Hispanic, Black, and Asian students when compared to White students.

The sample size contained approximately 7,000 four-year old children. The following literacy skills were assessed in the ECLS-B: alphabetic principle, receptive vocabulary knowledge and skills, expressive language, phonological awareness knowledge and skills as well as convention of print knowledge. The findings indicated statistically significant differences between scores of Black (one-third standard deviation) and Hispanic (one-half standard deviation) students when compared to White students. Asian students ranked half a standard deviation ahead of White students on reading

knowledge and skills. Whereas, the White students outscored the Asian students on language knowledge and skills.

The findings of the study supported similar findings of Rock and Stenner (2005) and Magnuson and Duncan (2006) which identified the achievement gap between White and Black students in kindergarten as well as the gaps present between Asian and White students. The results identify a pre-existing achievement gap in prekindergarten with the largest gap existing between Hispanic and White students. This study highlighted the inequality experiences of Hispanic students within the United States which acknowledged the need to continue to look at not only the Black-White achievement gap but other ethnic minority groups when studying the achievement gap (Wang, 2008).

Meta-analysis

A review of 27 studies of children who were environmentally at-risk or biologically at-risk by Simeonsson, Cooper, and Scheiner (1982) sought to determine what constitutes intervention, targeted population of current interventions, and the measurement used to determine effectiveness. They found the targeted groups to be children who were at-risk based on environmental or biological factors. Early intervention is defined as a systematic approach from infancy to early childhood. Last, the measure of effectiveness must have a minimum of two or more valid and reliable assessments of the participants' abilities.

In the cases studied the sample sized ranged from two to 75 subjects with a range in ages from two and a half months to six-years old. The interventions ranged from four weeks to two years. In contrast to White (1985), Simeonsson, Cooper, and Scheiner (1982) found parental involvement to be very influential as the home and center

programs accounted for more than two-thirds of the studies reviewed and 70% of the intervention were reinforced by the parents. Most of the interventions focused on motor development and general concepts of development. Few programs identified a specified curriculum. Although 70% used a standardized assessment, no single assessment was used frequently between programs for comparison data. Falling short of the 93% effectiveness rate presenting in the representative finding, Simeonsson, Cooper, and Scheiner (1982) findings revealed statistical evidence to support the effectiveness of early intervention at about 81%.

White (1985) examined 52 reviews of early intervention efficacy literature. Variables sited by previous reviewers being associated with effectiveness were age of intervention, duration and intensity, social economic status, and parental involvement. Those studies meeting the criteria were coded into five categories based on 90 variables. The five categories consisted of subjects included in the studies, the intervention duration and intensity, the study design, outcome assessed and the data collection process, and the mean difference between participant groups divided by the standard deviation of the control group's scores. The data revealed an increase in IQ measurements, 10-month reading advantage at second grade, parental involvement did not improve the results of the studies and the age of at which intervention began had no significant bearing on the outcome. Of the 52 studies, 60% of the outcomes were measured immediately following the intervention with 11% being assessed 36- months after the intervention. The gains made by the disadvantaged children within the studies tend to diminish overtime. White (1985) concluded the review with the need to not let the long-term effects of intervention cloud the judgement of the purpose of the intervention which is to give students the

opportunity to begin successful. Interventions clearly establish an immediate positive outcome. There is a growing need to study the long-term effects of interventions on social outcomes.

Gilliam and Zigler (2000) evaluated 13 of 33 state preschool programs operating in 1998. At the time, only 13 of the 33 operating programs had completed or on-going impact evaluations were available. Effect size was used to measure program effectiveness. Out of the 13 states involved, only 61% of the states required preschools to follow well-established guidelines in order to operate. Twenty-three percent of the states had no requirement for operation. Half of the state programs required a college degree with Vermont having had no requirements. Seven of the state evaluations were conducted by outside evaluators and the remaining six were conducted by their individual state departments of education. With the exception of Maryland collecting data up to the 10^{th} grade, the remaining states having a median length of third grade. Three of the states had no comparison for data collection and remaining states used up to five different comparison groups. Up to 11 domains were tracked by the different evaluations. The results yielded significant effects for the kindergarten year with inconsistent effects in the first grade and nonexistent in subsequent years.

Anderson et al., (2003) completed a systematic review of the literature to date which included 16 studies that meet the qualifications for inclusion. The review evaluated cognitive outcomes, social outcomes, child health screening outcomes, and family outcomes. Looking at the cognitive outcomes, nine studies used standardized academic measurements. Of the twelve, nine demonstrated increases in academic achievement, one had a negative effect and the remaining two did not provide the appropriate data to

calculate the effect size. Seven studies utilized IQ measurements. Six out of the seven revealed a positive effect on IQ from a one year to 10 years post-intervention. Five studies utilized retention rates as a cognitive measure. Of the five, four demonstrated lower retention rates with the one not having sufficient data to determine the effect. Five studies measured cognitive outcomes based on special education placement. All five studies showed a reduction in special education placement of students. These results conclude positive findings associated with early intervention programs for children at-risk. Anderson et al., (2003) recommended implementation of early childhood intervention programs based on the finding of effect data that demonstrates preventions in cognitive development, readiness to learn, grade retention, and special education placements.

Barnett (2005) reviewed 36 preschool programs serving underprivileged children. Out of the 36 programs reviewed Barnett (2005) suggested that only two of the programs (Abecedarian and Perry Preschool) studies provided valid data on the effects of early child care education. The other studies were corrupted due to limited sample sizes, attrition of sample, and no selection protocols (bias). The Abecedarian and Perry Preschool served predominantly African American students which limited the generalization of their results.

In using all the data from the 36 preschool programs, Barnett (2005) concluded early childhood care and education resulted in positive effects on the IQ in the early years of life. The effects of attendance contribute a meaningful difference in the lives of the children. Positive effects range from academic progression to general education instead

of special education. The earlier access is granted to impoverished children, the greater the academic results when children are placed in quality early intervention centers.

Wong, Cook, Barnett and Jung (2008) completed a review of the following states' prekindergarten programs: Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. The states were chosen based on the quality of the programs. The purpose of the study was to determine the effect of large scale prekindergarten programs and compare the effectiveness against reported Head Start effect levels. All of the states had a cut-off date for student entry into the program as well as a required percentage of students living in poverty. The age cut-offs allowed for a regression-discontinuity design to be used. Four out of the five states choose the pre-K classes randomly with one state that chose from a random sample from within the state's largest pre-k program. The children were randomly chosen for the control and treatment groups. The treatment group were students entering kindergarten during the fall of 2004 and the control group were students entering pre-K during the fall of 2004.

Peabody Picture Book Vocabulary was administered to measure receptive vocabulary. Preschool Comprehensive Test of Phonological and Print Processing was administered to measure print awareness. The test were administered in English and Spanish. Some students were excluded from the study due to language barriers. New Jersey had the highest effect size on student vocabulary and the smallest on print awareness. Michigan had the smallest effect size on vocabulary but the highest effect size on print awareness. When the final results were compared to Head Start, the state programs outperformed Head Start. The five states averaged .14 in vocabulary whereas Head Start averaged .08 effect size. Head Start averaged .36 whereas the five states

averaged .70 effect size in print awareness. Longitudinal data for comparison was not a part of this study (Wong, Cook, Barnett & Jung, 2008).

Duncan and Magnuson (2013) reviewed a total of 84 programs that have operated in the last half-century based on a strong experimental or quasi-experimental methodology that provided impact estimates on cognitive and achievement outcomes. The results measure the outcomes at the end of an academic year. The effect size for all 84 programs combined had a .35 standard deviation which is notably half of the racial gap found in kindergarten. The review also noticed that larger effect sizes were associated with smaller cohorts. The length of the programs varied from a summer program to a five year intervention with children from low-income families. The standard deviation ranged from .25 to .19 with the higher deviation associated with random assignment experiments. Also noted was the range in standard deviation based on published (.31) compared to those not published (.18) in peer-reviewed journals. Surprisingly programs that began prior to 1980 produced more significant effect sizes (.33) than those that began later (.16). Duncan and Magnuson (2013) contribute the decline in effect sizes within the last half century to increased living conditions and the numerous opportunities that children have had to be a part of center-based programs outside of those operated by governmental agencies.

Summary

The research findings concluded that early interventions are associated with positive gains in the cognitive development of children. The interventions raise the IQ levels, increase motor development, reduce special education rates, reduce retention rates, and reduce drop-out rates (Anderson et al., 2003; Barnett, & Epstein, 1993; Campbell et

al., 2002; Currie &Thomas, 2000; O'Brien & Dervarics, 2007; Schweinhart et al., 1994). Early intervention alone cannot close the achievement gaps of students who attend inferior schools upon entering public education, but it is clear that students who begin their education career failing in the early grades will continue on a path of failure throughout later years of schooling without an intervention in place. In an attempt to close the academic achievement that exists between at-risk children and their peers, early childhood development provides an opportunity to start kids at the gate with a stronger footing. Starting equipped at the gate provides real-world benefits such as higher educational achievement and employment, reductions in teen pregnancy, drop-out rates, drug use, and incarceration (Ramey & Ramey, 1999; 2004; Schweinhart et al., 1994).

Findings in the historical studies and the contemporary studies of prekindergarten programs identify a sleeper effect of results. The results yield significant results in the kindergarten year and fadeout prior to the end of first grade in most studies. Most of the studies completed also compare a preschool cohort (untreated) to a kindergarten cohort (treated) to determine the effectiveness. The review of literature indicates a need to further explore the relationship between preschool and academic achievement. In an attempt to provided more definitive answers, this researcher utilized the literature to inform the research question, hypothesis, and design to determine the effectiveness of prekindergarten on kindergarten readiness. With multiple decades of research on early intervention, research has revealed that short term cognitive development and school achievement enhance competencies over an extensive period of time but recognizes that these interventions are often shortened due to the inferior schools attended by children living in poverty (Reynolds & Temple, 1998).

CHAPTER THREE: METHODOLOGY

Introduction

This casual comparative study examined the relationship between kindergarten emergent literacy skills and the effect of attending prekindergarten. The target population were students enrolled in the Mid-Cumberland public school system's kindergarten class of 2014-2015. Those students who did not complete the Northwestern Education Assessment (NWEA) in the fall 2014, winter, and spring 2015 were excluded from the study. Students were divided into a treatment (those who attended the district's prekindergarten during the 2013-2014 academic year) and control (those who did not attend the district's prekindergarten during the 2013-2014 academic year).

Purpose of the Study

The purpose of the study was to determine the effects of a district's prekindergarten programs on the kindergarten literacy skills who attended as measured by NWEA. Determining the effectiveness of the prekindergarten program on equipping students with the literacy skills needed upon kindergarten entry will add to the existing literature that allows states to advocate support for the prekindergarten initiatives.

The state Annual Measurement Objectives (AMO) will be used to disaggregate data comparing the literacy skills of those students who attended the district's prekindergarten program to those students who did not attend the district's prekindergarten program to determine if a literacy gap exists in kindergarten. Student groups are determined by the state of Tennessee's Department of Education AMO's which includes ethnicity, race, socio-economics, special education, and English-Language- Learners (ELL). The P-MAP was administered in September (fall), January

(winter), and April (spring) of the 2014-2015 academic year. The test measures foundational skills (phonics and word recognition, phonological awareness and print concepts), language and writing (capitalization, spelling, punctuation, language, and writing), literature and informational text (key ideas, details, craft, and structure) and vocabulary use and functions (context clues, references, vocabulary acquisition, and use). Student's RIT scores will be used determine if a literacy gap exists between the different student groups.

Study Population

The population of this study includes 1163 kindergarten students who attended one of the twelve schools in the Mid-Cumberland school district. All students enrolled in kindergarten must have been five-years of age on or by August 31, 2014. Within the kindergarten population 372 students attended the district's prekindergarten program which comprised the treatment group. The prekindergarten program specifically serves students identified as "at-risk" (See Page 19). Students in the prekindergarten program (treatment group) would have been four-years of age on or by August 31, 2013 in order to participate in the district's prekindergarten program. These prekindergarten students attended one of seven sites within the Mid-Cumberland district with three being off campus sites.

The results of the 2015 spring kindergarten P-MAP yielded a 162.7 mean RIT score with a standard deviation of 13.1 and a median score of 162. The score utilizes 1127 kindergarten students who took the 2015 spring assessment. This average is above the kindergarten norm set by NWEA which is 157.7. The district's average is 5-points higher than the 2011 reading status norms indicated by NWEA (See Table 5).

Table 1-Participant Characteristics

Race	Prekindergarten attendance 2013-2014 (n = 372)	No Prekindergarten attendance 2013-2014 (n = 791)	Total Kindergarten 2014-2015 (n = 1163)
Hispanic	82	42	124
Caucasian	126	541	681
African American	124	112	263
Asian	10	30	52
Indian	1	0	1
Pacific Islander	0	1	1
Multi-racial	29	65	94

Procedure

Students in the kindergarten class of 2014-2015 were administered the P-MAP testing three times (August, December, and May) during the academic year. The testing windows were established by the district testing coordinator prior to the beginning of the academic school year. Each school was given a two week window to complete the test. Individual teachers who administered the test were trained by school testing coordinators on proper techniques and procedure of test administration. Teachers set up classes in NWEA and school testing coordinators established a testing calendar. Students were tested on their assigned dates three times during the year. All students completed the test without accommodations or assistance on the computer. No accommodations were given to special education students, ELL students, or any other student in order to maintain the

validity and reliability of the assessment. Student test results were computed at the end of the test with a report generated the following day. The test was not timed therefore time was not a limited factor. Students were able to work at their own pace in order to complete the literacy assessment. Only students who completed all three test were included in the study population.

Given access to the Mid-Cumberland district's P-MAP database, kindergarten testing data was extracted. The district's attendance clerk provided all of the kindergarten student demographic information for the 2014-2015 academic school year and the prekindergarten demographics for the 2013-2014 academic year. A combination of the data was utilized to conduct the study.

Data Collected

The student data obtained for this study follow: (a) school and grade, (b) date of birth, (c) sex and race, (d) free and reduced lunch eligibility, (e) special education status, (f) ELL status, (g) ethnicity (Hispanic/Latino), (h) attendance and (i) RIT score for all NWEA assessments.

Data Collection Instrument

The instrument used to collect data was an on-line kindergarten Primary-Measure of Academic Progress (P-MAP) developed by NWEA. In 2011, a norms study was conducted to determine the Rasch Unit (RIT) scale, a stable equal-interval vertical scale. The scale allowed student performance comparisons to national achievement and growth norms against state standards (Common Core State Standards). The P-MAP assessments generated individual RIT scores which indicated a student's ability to answer a given level of question difficulty correctly about 50% of the time. The scores were

used to identify each individual's zone of proximal development based on their achievement level at the time of testing. The test questions ranged from kindergarten to Grade 11. The test made adjustments based on student accurate or inaccurate responses to posed questions which increased or decreased the level of difficulty (Northwest Education Association, 2011; Woodfield, 2003).

To establish validity, the study used a minimum random sample of 20,000 students per grade level from a sample size of 5.1 million students representing 13,000 schools in 2,700 school districts. The RIT scale takes into account the number of weeks of instruction. The RIT scale provides norm referenced data that provide national percentile rankings comparing students within the same grade-level to other students in the same grade-level across the country (Northwest Education Association, 2011; Woodfield, 2003).

The MAP for Primary Grades was the chosen instrument for measurement as it is the district's benchmark exam that meets the state of Tennessee requirements for Response to Intervention (RTI). Using the RIT scale to norm students, students' literacy results are used to determine RTI needs. Students with scores in the 10th percentile or below are placed in Tier III instruction (the most intensive intervention). Students with scores that fall between the 11th -25th percentiles are placed in Tier II instruction (an intermediate intervention). Students scoring above the 25th percentile have demonstrated understanding of grade-level academic standards (Yzquierdo & Tyler, N/A).

Experimental Design

A quantitative, non-experimental, comparative study with extant data was designed to determine whether participation in the Mid-Cumberland public school

district's prekindergarten program had an effect on students' early literacy skills in kindergarten. Quantitative research is a "formal, objective, systematic process in which numerical data is used to obtain information about the world" (Burns & Grove, 2005, p. 26). Although not very popular, field trials are more common in education. Field trials tend to use preexisting groups for treatment. These studies use natural clusters in the population due to the setting of the study (i.e., schools). It is possible to use statistical procedures to rule out any differences in the results due to pre-existing conditions which threaten internal validity (Gorard, 2001).

When true experimental designs cannot be employed to conduct an experiment, causal-comparative studies may be conducted (Van Dalen, 1979). Causal comparative studies are used to describe relationships between a past occurrence and subsequent responses to the occurrence (McMillan, 1992). In this study design the researcher is unable to manipulate the variables that may contribute to the findings but some control can be achieved by analyzing the possible effects of variables on the outcome. Causal-comparative studies can be visualized as indicated in Table 2:

Table 2-Causal Comparative Design Model

Non-randomly assigned groups	X, Independent Variable (not manipulated by investigation)-Treatment	Y, Dependent Variable
Experimental Group (T_E)	X	T_E
Control Group (T_C)		T_C

X represents the treatment of the experimental group and T_C and T_E represent the measurement of the outcome (Van Dalen, 1979).

Van Dalen (1973) suggested that experimental methods be employed but sometimes those methods are not feasible based on the population in question. When this is the case, causal-comparative is a feasible method to explore the problem. In education, one is not always able to control, select, or manipulate factors necessary to examine relationships. In an attempt to control all but a single variable, the researcher may free the single variable from the influence of the other confounding variables.

A comparative study was the most appropriate design because there was no manipulation of treatment or randomization of the participants. A correlational study approach was inappropriate because the objective is not to determine a correlation between variables but the causal relationship between the independent and dependent variable. An experimental study was inappropriate because there was no manipulation of independent variables (prekindergarten) nor the student grouping (all kindergarteners) and extant data is used for the measurement outcome. Since the independent variable has already occurred, it is not feasible to manipulate the treatment or the randomization of the participants nor the data collection process (Mertler, 2014).

In a comparative study with an extant data set, the researcher examines the effects of treatment after it has occurred, rather than creating the treatment itself, and attempts to identify a relationship looking retrospectively at the independent variable and the dependent variable. In this study, I compared the independent variable of early literacy scores as measured by NWEA at three different points in the school year: fall (August), winter (December), and spring (May) for all kindergartens who completed all three tests in the 2014-2015 academic year.

Due to design restrictions, group equivalences could not be assured since the treatment occurred prior to the study of the participants' literacy skills. The intact groups were similar in age as all participants were enrolled in kindergarten during the 2014-2015 academic year. Including all of the school district's kindergarten students provides some limits to the threat of external and internal validity. Internal validity refers to the validity of making an inference linking the independent variable and the dependent variable in a cause-and-effect relationship. External validity embraces the generalizability of the experiments results to populations, experimental variables, measurement variables, and situations (Isaac & Mitchell, 1997; Van Dalen, 1979; Wiersma & Jurs, 2009).

Threats to internal validity are history, maturation, testing, instrumentation, statistical regression, selection, mortality, and selection maturation interaction. The design controls for testing as there was no pretest given to determine equality of the groups which limits the cues of the subject content. The design also controls for instrumentation. The test is computer-based so it controls for researchers' errors administering the test. The number of items fluctuate depending on student ability. The test can evaluate up to eleventh grade. The test has a reliability coefficient of .92 - .95 for internal consistency, test re-test with same form .79 - .94 and test re-test with equivalent form .89 - .96 (Andren, 2010; Brown, & Coughlin, 2007). All students are tested under similar conditions with no time limits. The selection process factors as a threat due to the lack of control of the treatment. In order to limit the selection threat, all kindergarteners enrolled in the district that completed all three implementations of the assessments were included in the study. History, maturation, selection-maturation interaction, and statistical regression are threats to the validity of the experiment due to the study design (Campbell

& Stanley, 1963; Green, 2010; Gorard, 2001; Isaac & Mitchell, 1997; Van Dalen, 1979; Wiersma & Jurs, 2009).

External threats to validity are interaction effect of testing, interaction effects of selection bias and treatment, reactive effects of experimental arrangements, and multiple-treatment interference. The causal-comparative design limits the interaction of testing as the testing is conducted after the treatment. The multiple-treatment interference is also controlled as the treatment is only administered once. The experiment neither controls for reactive effect of experimental arrangements nor completely controls selection bias and treatment due to the group receiving the treatment not being randomly selected (Campbell & Stanley, 1963; Green, 2010; Gorard, 2001; Isaac & Mitchell, 1997; Van Dalen, 1979; Wiersma & Jurs, 2009). Selection bias is limited due to the sample chosen for the research. The sample chosen is representative of the district population as the entire kindergarten population is the sample. As internal validity is greatly threatened by the design, it is important to limit the external validity (Schenker & Phillip, 2004).

Non-experimental research such as the causal-comparative design provides the means for assessing the effectiveness of educational interventions. Although a direct test of the effectiveness of the intervention may not be provided, this type of research allows for cause-and-effect relationships to be made by reducing the number of variables that may affect the results and by stratification of the test variable. It is through careful planning and conduction of an experiment that threats are limited. Limits to validity should be recognized but in an attempt to control validity one could jeopardize validity of another threat. The researcher must balance the threats without altering the realism so the

results can be used for the intended purpose (Maruyama & Deno, 1992; Van Dalen, 1979).

Data Analysis

The data for the study was analyzed by SPSS PC computer based statistical software. Statistical test were conducted to determine if a statistically significant difference was present in the student groups of interest identified in the research questions.

Results of the above analyses are presented in chapter four.

Hypotheses

The following null hypotheses will be tested for statistical significance at the .05 alpha level:

1. There is no statistically significant difference in the emergent literacy skills between students who attend voluntary prekindergarten and those who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
2. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
3. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically

disadvantaged who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

4. There is no statistically significant difference in the emergent literacy skills of African American students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
5. There is no statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of Non-Hispanic/Latino students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
6. There is no statistically significant difference between in the emergent literacy skills of economically disadvantaged Caucasians students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten.
7. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Caucasian students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
8. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of economically

disadvantaged African-American students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

9. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
10. There is no statistically significant difference in the emergent literacy skills of ELL students who did not attend voluntary prekindergarten and the emergent literacy skills of ELL students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
11. There is no statistically significant difference in the emergent literacy skills of special education students who did not attend voluntary prekindergarten and the emergent literacy skills of special education students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Summary

The introduction and background of the problem were presented in Chapter 1. The problem was identified and the need for the study, terminology, objectives, general procedures, and limitations were discussed in Chapter 1. Chapter 2 contains the review of related literature. Chapter 3 contains a description of the research procedures and measurement instrument and a list of hypotheses tested in the investigation. Chapter 4 includes the statistical analyses necessary for testing hypotheses and research findings. A

summary of the investigation and a discussion of findings and conclusions of the study appear in Chapter 5.

CHAPTER FOUR: RESULTS

Presentation and Analysis of Data

The researcher investigated the emergent literacy skills of students who participated in a Mid-Cumberland school district's prekindergarten program with students who did not participate in the program. Extant data from the district's twelve schools were used in this quantitative comparative research. A multivariate analysis was conducted to determine any effects that the independent variables had on the dependent variables. All participants in the study were administered the Primary-Measure of Academic Progress (P-MAP) three times throughout their kindergarten experience to measure their emergent literacy skills.

Student proficiency levels of emergent literacy skills were measured on three different occasions during their kindergarten year. A total of 1432 kindergarten students passed through kindergarten during the 2014-2015 academic year. During the academic year, some students withdrew from one of the district's 12 schools or failed to complete all three of the test administrations. As a result, only 999 kindergarten students received a score for all three administrations of the test. Only those students who received a score for each of the three administered assessments were included in the data analyses.

The population for this study consisted of 999 kindergarten students who completed all three administrations of the Primary-Measure of Academic Progress. The data displayed in Tables 3 - 5 provide the benchmark measurements of the three administrations of the assessment during the kindergarten year. The benchmarks provide norm scores for each of the test.

Table 3-Fall Administration Scores

	Norm Benchmark	%	n
Below Beginning	141.4 or below	42.27%	422
Meet Beginning	142.5 - 150.9	34.33%	343
Meet Middle	151 - 157.6	12.81%	128
Meet End	157.7 – 160.2	3.30%	33
1st Grade	160.3 – 176.9	6.31%	63
Above 1st Grade	177 +	1.00%	10

Table 4-Winter Administration Scores

	Norm Benchmark	%	n
Below Beginning	141.4 or below	14.61%	146
Meet Beginning	142.5 - 150.9	22.42%	224
Meet Middle	151 - 157.6	23.22%	232
Meet End	157.7 – 160.2	9.71%	97
1st Grade	160.3 – 176.9	24.82%	248
Above 1st Grade	177 +	5.21%	52

Table 5-Spring Administration Scores

	Norm Benchmark	%	n
Below Beginning	141.4 or below	3.70%	37
Meet Beginning	142.5 - 150.9	10.11%	101
Meet Middle	151 - 157.6	18.62%	186
Meet End	157.7 – 160.2	9.51%	95
1st Grade	160.3 – 176.9	44.44%	444
Above 1st Grade	177 +	13.61%	136

The data from Tables 3-5 revealed that 42% of the incoming kindergarten class were below grade-level on the fall administration, which shrunk to 15% on the winter administration to a mere 4% on the spring administration. At the beginning of the year only 11% of the incoming kindergarten class at least met the end of the year expectation on the fall administration, which rose to 40% on the winter administration and ended with 68% of the incoming kindergarten class meeting at least the end of the year expectation.

The number of students who were in the 10th percentile or below after the fall administration was 32 students, 53 students after winter administration, and 35 students after the spring administration. All of these students fell into Tier III. These students received intervention from a reading interventionist. The number of students who were in the 11th to 20th percentile after the fall administration was 38 students, 51 students after winter administration, and 53 students after the spring administration. These students fell into Tier II reading intervention which qualified them for reading intervention by a

highly-qualified teacher within the grade-level. The number of students who qualified for Tier II may be slightly higher as the qualifications for Tier II reading intervention are students whose percentile range falls within the 11^{th} – 25^{th} percentile. The data was collected with the percentile ranks being evenly distributed by tens.

Analyses of Data

Eleven major research questions were addressed in this study, from which eleven null hypotheses were derived. Multivariate data analyses were used to determine whether to accept or reject the null based at the .05 level of significance.

Null Hypothesis 1

There is no statistically significant difference in the emergent literacy skills between students who attend voluntary prekindergarten and those who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of prekindergarten attendance on emergent literacy skills. The sample size of this analysis consisted of 999 students with 724 students that did not attend voluntary prekindergarten and 275 who did participate in the voluntary prekindergarten program. The initial 2 (Attendance) X 3 (Assessments) multivariate tests were done on data which revealed a statistically significant difference in the emergent literacy scores of students who attended prekindergarten and students who did not attend voluntary prekindergarten, $F (3, 995) = 10.515$, $p = .000$. The students who did not attend voluntary prekindergarten outperformed the students who did attend as measured by P-MAP, see Tables 5 and 6. Further analysis of the data indicated that a statistically significant difference in the emergent literacy skills existed between students who attended prekindergarten and those

who did not attend prekindergarten as measured by the fall, F (1, 997) = 18.50, p = .000, winter, F (1, 997) = 29.68, p = .000 and spring assessment, F (1, 997) = 12.05, p = .001. Therefore the null hypothesis was rejected in favor of the alternate hypothesis: There is a statistically significant difference between students who attended voluntary prekindergarten and those who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Table 6-Scores of Between-Subject Factors - Student Attendance vs Non-Attendance

	Prekindergarten Attendance	Mean	SD	N
Fall	1	141.81	9.731	275
	2	145.31	12.080	724
	Total	144.34	11.583	999
Winter	1	151.28	11.262	275
	2	156.10	12.913	724
	Total	156.10	12.913	999
Spring	1	160.81	11.869	275
	2	164.20	14.422	724
	Total	163.26	13.844	999

Note: 1 = prekindergarten attendance; 2 = did not attend prekindergarten

Table 7-Test of Between-Subject Effects - Student Attendance vs Non-Attendance

Source	Dependent Variable	Type III SS	Df	MS	F	Sig.
Prekindergarten Attendance	Fall	2438.593	1	2438.593	18.496	.000
	Winter	4623.834	1	4623.834	29.683	.000
	Spring	2283.918	1	2283.918	12.049	.001
Error	Fall	131452.326	997	131.848		
	Winter	155308.672	997	155.776		
	Spring	188984.316	997	189.553		

Note: $p < .05$

Further analysis of null hypothesis 1 was completed to compare the scores of all of the students who attended Title I schools. The scores were evaluated based on prekindergarten attendance. The results revealed a significant difference in the emergent literacy skills between the scores of students who attended Title I schools, $F (3, 625) = 2.71$, $p = .044$. Additional evaluation of the data showed a significant difference on the winter and spring administration of the assessment with students who did not attend prekindergarten outscoring the students who did attend prekindergarten. A total of 629 students were included in this sample size with 234 attending prekindergarten and 395 not attending prekindergarten. Comparison of mean scores on all three assessments between the two groups were within three points. The data was possibly skewed due to a large percentage (63%) of non-participation in the voluntary prekindergarten program of students who attended Title I schools as well as the economics differences of the students within the population sample.

In contrast to the significant difference found between students attending Title I schools, students who attended a Non-Title I school did not show any significant difference in the emergent literacy skills between those students who participated in voluntary prekindergarten and non- participants. The mean scores for the fall test were within three points and at the end of the year the scores between the two groups were within one-point from each other. The sample size for this analysis was 370 students with 41 of the students having participated in voluntary prekindergarten and the remaining 329 students were non-participants. The lack of a significance in this analysis is possibly effected by the sample size and the group ratios. The Non-Title I schools' mean on all three assessments were higher than the Title I schools' means. Students attending the Non-Title I schools who participated in the voluntary prekindergarten program mean scores were higher than Title I school students' scores on all three assessments.

Null Hypothesis 2

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of free and reduced lunch (Economically Disadvantaged Students, see p. 17) on emergent literacy skills of students who attended voluntary prekindergarten compared to students who did not attend voluntary prekindergarten for null hypothesis 2. The sample size of this analysis was 552 students which included 275 that attended voluntary prekindergarten and 277 that did not attend the voluntary prekindergarten program. Initial 1 (Economics) X 2

(Prekindergarten Attendance) X 3 (Assessment) multivariate tests were done on data which revealed that there was no statistically significant difference in the emergent literacy skills on any of the three assessments, F (3,548) = 1.037, p = .376. Therefore the second null hypothesis is accepted, see Tables 8 and 9. The mean scores of the assessments demonstrated growth by both sample populations on future administrations of the assessments. The means scores on all three assessments range between 0 – 1.5 points between the two sample populations.

Table 8-Scores Between-Subject Factors – Economically Disadvantaged Students: Attendance vs Non-attendance

	Economically Disadvantaged	Mean	SD	N
Fall	1	141.81	9.731	275
	2	141.31	10.105	277
	Total	141.56	9.915	552
Winter	1	151.28	11.262	275
	2	151.42	12.040	277
	Total	151.35	11.648	552
Spring	1	160.81	11.869	275
	2	159.77	12.300	277
	Total	160.29	12.088	552

Note: 1 = prekindergarten attendance; 2 = did not attend prekindergarten

Table 9-Test of Between-Subject Effects – Economically Disadvantaged Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	MS	F	Sig.
Prekindergarten Attendance	Fall	34.060	1	34.060	.346	.557
	Winter	2.521	1	2.521	.019	.892
	Spring	148.784	1	148.784	1.018	.313
Error	Fall	54130.085	550	98.418		
	Winter	74756.696	550	135.921		
	Spring	80358.839	550	146.107		

Note: $p < .05$

Null Hypothesis 3

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of economics on emergent literacy skills of students not attending prekindergarten. The sample size used to test this hypothesis consisted of 724 with 277 students being economically disadvantaged and 447 not being economically disadvantaged. Initial 2 (Economics) X 2 (Prekindergarten Attendance) X 3 (Assessments) multivariate tests were done on data which revealed that there was a significant difference in the emergent literacy skills between economically disadvantaged and non-economically disadvantaged who did not attend prekindergarten,

F (3, 720) = 23.74, p = .000. Further analyses showed a significant effect of economics on students' performance in fall, F (1, 722) = 56.56, p = .000, likewise performance in winter, F(1, 722) = 64.18, p = .000 and performance in spring, F (1, 722) = 44.76, p= .00. Additionally, analyses showed that non-economically disadvantage students out performed economically disadvantage students on all three administrations of the assessment, see Tables 10 and 11. Therefore, the third null hypothesis was rejected in favor of the alternate hypothesis: There was a statistically significant difference in the emergent literacy skills of economically disadvantaged students and the emergent literacy skills of non-economically disadvantaged who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Table 10-Scores Between-Subject Effect – Economics Effects on Students: Attending vs Not Attending

	E = Lunch	Mean	SD	N
Fall	1	141.31	10.105	277
	2	147.78	12.543	447
	Total	145.31	12.080	724
Winter	1	151.42	12.040	277
	2	159.00	12.592	447
	Total	156.10	12.913	724
Spring	1	159.77	12.300	277
	2	166.94	14.962	447
	Total	164.20	14.422	724

Note: E1 = free or reduced lunch; E2 = no free or reduced

Table 11-Test of Between-Subject Effects – Economics Effects on Students: Attending vs Not Attending

Source	Dependent Variable	Type III SS	Df	MS	F	Sig.
E	Fall	7159.726	1	7159.726	52.562	.000
	Winter	9832.978	1	9832.978	64.117	.000
	Spring	8779.232	1	8779.232	44.763	.000
Error	Fall	98347.814	722	136.216		
	Winter	110726.254	722	153.360		
	Spring	141604.918	722	196.129		

Note: $p < .05$

Null Hypothesis 4

There is no statistically significant difference in the emergent literacy skills of African American students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of race on emergent literacy skills of students not attending voluntary prekindergarten. The sample size used to test this null hypothesis consisted of 678 with 538 Caucasian students and 140 African-American students. The initial 2 (Race) X 3 (Assessment) multivariate tests were done on data which revealed that there was a significant difference in the emergent literacy skills between African-American students and Caucasian students who did not attend voluntary prekindergarten, $F (3, 674) = 5.23$, $p = .001$. Further analyses showed a statistically

significant effect on students'performance in Fall, F (1, 676) = 9.52, p = .002, likewise performance in Winter, F (1, 676) = 14.28, p = .00 and performance in Spring, F(1, 676) = 12.48, p = .00. Additionally, analyses showed that Caucasian students scored higher than African-American students on all three administrations of the assessment, see Tables 12 and 13. Therefore, the fourth null hypothesis was rejected in favor of the alternate hypothesis. There was a statistically significant difference in the emergent literacy skills of African American students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Table 12-Scores of Between-Subject Effects - African-American vs Caucasian Students: Not Attending

	Race	Mean	Std. Deviation	N
Fall	1	146.12	12.438	538
	2	142.59	10.562	140
	Total	145.39	12.152	678
Winter	1	157.16	13.100	538
	2	152.53	12.204	140
	Total	156.21	13.047	678
Spring	1	165.27	14.664	538
	2	160.44	13.498	140
	Total	164.27	14.553	678

Note: 1= Caucasians; 2 = African-Americans

Table 13-Tests of Between Subject Effects - African-American vs Caucasian Students: Not Attending

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Race	Fall	1388.305	1	1388.305	9.520	.002
	Winter	2384.686	1	2384.686	14.283	.000
	Spring	2599.717	1	2599.717	12.482	.000
Error	Fall	98581.118	676	145.830		
	Winter	112861.817	676	166.955		
	Spring	140791.256	676	208.271		

Note: $p < .05$

Null Hypothesis 5

There is no statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of Non-Hispanic/Latino students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of Hispanic/Latino descent on emergent literacy skills of students not attending voluntary kindergarten. In this analysis, the two racial groups being compared were Hispanic/Latino students to Non-Hispanic/Latino students. The sample size used to test this null hypothesis consisted of 724 students with 43 Hispanic/Latino students and 681 Non-Hispanic/Latino students. The initial 1 X (No Attendance) X 2 (Hispanic/Latino) X 3 (Assessment) multivariate tests were done on data which revealed that there was a significant difference in the emergent literacy skills between Hispanic/Latino students and Non-Hispanic/Latino

students who did not attend voluntary prekindergarten, F (3, 720) = 8.63. p = .000. Further analysis showed that Non-Hispanic/Latino students outperformed Hispanic/Latino students on all three assessments with a mean score averaging from 6-10 additional points on the assessments. Therefore the fifth null hypothesis was rejected in favor of the alternate hypothesis. There was a statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attended voluntary prekindergarten and the emergent literacy skills of non-Hispanic/Latino students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment, see Tables 14 and 15.

Table 14-Scores of Between Subject Effects - Hispanic/Latino vs Non-Hispanic/Latino: Students Not Attending

	Race	Mean	Std. Deviation	N
Fall	1	139.30	9.135	43
	2	145.68	12.148	681
	Total	145.31	12.080	724
Winter	1	146.53	10.366	43
	2	156.70	12.826	681
	Total	156.10	12.913	724
Spring	1	156.07	10.112	43
	2	164.71	14.505	681
	Total	164.20	14.422	724

Note:1 = Hispanic/Latino; 2 = Non-Hispanic/Latino

Table 15-Tests of Between Subject Effects - Hispanic/Latino vs Non-Hispanic/Latino: Students Not Attending

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Hispanic/ Latino	Fall	1647.348	1	1647.348	11.452	.001
	Winter	4179.645	1	4179.645	25.930	.000
	Spring	3018.927	1	3018.927	14.791	.000
Error	Fall	103860.192	722	143.851		
	Winter	116379.588	722	161.191		
	Spring	147365.222	722	204.107		

Note: $p < .05$

Null Hypothesis 6

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasians students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment.

A test was performed to determine the main effect of the economics on emergent literacy skills of Caucasian students. The sample size of this analysis consisted of 538 students with 175 economically disadvantaged Caucasian students and 363 non-economically disadvantaged Caucasian students. The initial 1 (Caucasian) X 2 (Economics) X 3 (Assessments) multivariate tests were done on data which revealed that there was a significant difference in the emergent literacy skills between economically disadvantaged Caucasian students who did not attended prekindergarten and non-

economically disadvantaged Caucasian students who did not attend voluntary prekindergarten, $F (3, 534) = 13.939$, $p = .000$. Further analysis revealed that Caucasian students who were not economically disadvantaged outperformed Caucasian students who were economically disadvantaged on all three administrations of the assessments, fall, $F(1,536) = 5049.32$, $p = .000$, likewise winter, $F (1,536) = 5533.271$, $p = .000$ and spring, $F (1, 536) = 4510.912$, $p = .000$. Therefore, the null hypothesis was rejected in favor of the alternate hypothesis. There was a statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasians students who did not attended voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten as assessed by P-MAP literacy assessment, see Tables 16 and 17.

Table 16-Scores of Between-Subject Effects - Caucasian Students Not Attending: Economically Disadvantaged vs Non-economically Disadvantaged

	Economics	Mean	Std. Deviation	N
Fall		141.71	10.798	175
	1	148.25	12.629	363
	2			
	Total	146.12	12.438	538
Winter		152.54	12.904	175
	1	159.39	12.620	363
	2			
	Total	157.16	13.100	538
Spring		161.10	12.423	175
	1	167.28	15.242	363
	2			
	Total	165.27	14.644	538

Note:1 = Economically Disadvantaged; 2 = Non- Economically Disadvantaged

Table 17-Tests of Between Subject Effects - Caucasian Students Not Attending: Economically Disadvantaged vs Non-economically Disadvantaged

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Caucasian	Fall	5049.324	1	5049.324	34.686	.000
	Winter	533.271	1	5533.271	34.237	.000
	Spring	4510.912	1	4510.912	21.791	.000
Error	Fall	78025.823	536	145.571		
	Winter	86627.660	536	161.619		
	Spring	110955.923	536	207.007		

Note: $p < .05$

Null Hypothesis 7

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Caucasian students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of economics and prekindergarten attendance on the emergent literacy skills of Caucasian students. The sample used to test this null hypothesis consisted of 288 students with 113 students that attended voluntary prekindergarten and 175 who did not participate in the voluntary prekindergarten program. Initial 1 (Caucasian) X 1 (Economics) X 2 (Attendance) X 3 (Assessments) multivariate tests revealed there was no significant difference in the emergent literacy skills between economically disadvantaged Caucasian students who

attended the voluntary prekindergarten program when compared to economically disadvantaged Caucasian students who did not attend the voluntary prekindergarten program., F (3, 284) = 1.292, p = .277. The mean scores between both groups fell between 1-2 points of each other on all three assessments with a slight advantage toward the students not attending the voluntary prekindergarten program, see Tables 18 and 19. Therefore the null hypothesis was accepted.

Table 18-Scores of Between-Subject Effects – Economically Disadvantaged Caucasian Students: Attendance vs Non-attendance

	Prekindergarten Attendance	Mean	Std. Deviation	N
Fall	1	139.80	8.732	113
	2	141.71	10.798	175
	Total	140.96	10.066	288
Winter	1	150.25	10.368	113
	2	152.54	12.904	175
	Total	151.64	12.007	288
Spring	1	160.20	11.104	113
	2	161.10	12.423	175
	Total	160.75	11.911	288

Note: 1= Caucasian prekindergarten attendance; 2 = Caucasian did not attend kindergarten

Table 19-Tests of Between Subject Effects – Economically Disadvantaged Caucasian Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Prekindergarten Attendance	Fall	251.044	1	251.044	2.491	.116
	Spring	361.673	1	361.673	2.522	.113
	Winter	55.533	1	55.533	.391	.532
Error	Fall	28826.456	286	100.792		
	Spring	41014.491	286	143.407		
	Winter	40664.467	286	142.183		

Note: $p < .05$

Null Hypothesis 8

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged African-American students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of economics and prekindergarten attendance on the emergent literacy skills of African-American students. The sample size used to test this null hypothesis consisted of 189 students with 99 students that attended the voluntary prekindergarten program and the remaining 90 students did not participate in the program The Initial 1 X (African-American) X 1 (Economics) X 2 (Attendance) X 3 (Assessments) multivariate tests were done on data which revealed that there was no

significant difference in the emergent literacy skills between economically disadvantaged African-American students who attended voluntary prekindergarten when compared to economically disadvantaged African-American students who did not attend the voluntary prekindergarten program, F (3,185) = 1.388, p = .248. The mean score for all three assessments were between 1-2 points with a slight advantage for those students that attended the voluntary prekindergarten program, see Tables 20 and 21. Therefore the null hypothesis was accepted.

Table 20-Scores of Between-Subject Effects – Economically Disadvantaged African-American Students: Attendance vs Non-attendance

	Prekindergarten Attendance	Mean	Std. Deviation	N
Fall	1	141.53	9.484	99
	2	140.43	8.671	90
	Total	141.01	9.098	189
Winter	1	149.13	11.012	99
	2	149.28	10.018	90
	Total	149.20	10.523	189
Spring	1	159.56	11.929	99
	2	157.42	12.131	90
	Total	158.54	12.041	189

Note: 1= African-American prekindergarten attendance; 2 = African-American did not attend kindergarten

Table 21-Tests of Between Subject Effects – Economically Disadvantaged African-American Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Prekindergarten Attendance	Fall	56.208	1	56.208	.678	.411
	Spring	1.011	1	1.011	.009	.924
	Winter	214.552	1	214.552	1.484	.225
Error	Fall	15506.787	187	82.924		
	Spring	20815.348	187	111.312		
	Winter	27044.400	187	144.622		

Note: $p < .05$

Null Hypothesis 9

There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the effect of economics and prekindergarten attendance on the emergent literacy skills of Hispanic/Latino students. The sample size used to test the null hypothesis consisted of 81 students with 51 students that attended voluntary prekindergarten and 30 students who did not participate in the voluntary prekindergarten program. The initial 1 (Hispanic/Latino) X 1 (Economics) X 2

(Attendance) X 3 (Assessments) multivariate test was done on data which revealed there was no significant difference in the emergent literacy skills between the economically disadvantaged Hispanic/Latino who attended prekindergarten when compared to the economically disadvantaged Hispanic/Latino who did not attend the prekindergarten program, $F (3, 77) = .723$, $p = .541$. The mean score between the two groups on all test ranged between 1-4 points. The economically disadvantaged Hispanic/Latino students that attended voluntary prekindergarten outperformed the economically disadvantaged Hispanic/Latino students that did not attend the voluntary prekindergarten program. The mean score difference increased on each administration of the test, see Tables 22 and 23. Therefore, the null hypothesis was accepted.

Table 22-Scores of Between-Subject Effects – Economically Disadvantaged Hispanic/Latino Students: Attendance vs Non-attendance

	Prekindergarten Attendance	Mean	Std. Deviation	N
Fall	1	137.08	8.706	51
	2	136.40	8.950	30
	Total	136.83	8.748	81
Winter	1	148.02	10.170	51
	2	144.83	9.440	30
	Total	146.84	9.967	81
Spring	1	157.96	12.485	51
	2	154.30	10.313	30
	Total	156.60	11.796	81

Note: 1= Hispanic/Latino prekindergarten attendance; 2 = Hispanic/Latino did not attend kindergarten

Table 23-Tests of Between-Subject Effects – Economically Disadvantaged Hispanic/Latino Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Prekindergarten Attendance	Fall	8.694	1	8.694	.112	.738
	Spring	191.767	1	191.767	1.953	.166
	Winter	253.136	1	253.136	1.838	.179
Error	Fall	6112.886	79	77.378		
	Spring	7755.147	79	98.166		
	Winter	10878.222	79	137.699		

Note: $p < .05$

Null Hypothesis 10

There is no statistically significant difference in the emergent literacy skills of ELL students who did not attend voluntary prekindergarten and the emergent literacy skills of ELL students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of prekindergarten attendance on the emergent literacy skills of ELL students. The sample size used to test this null hypothesis consisted of 57 students with 29 ELL students that attended voluntary prekindergarten and 28 ELL students who did not participate in the voluntary prekindergarten program. An Initial 1 (ELL) X 2 (Attendance) X 3 (Assessments) multivariate tests were done which revealed that there was no significant difference in the emergent literacy skills between ELL students who attended voluntary prekindergarten

and ELL students who did not attend voluntary prekindergarten, F (3,53) = .588, p = .626. The mean scores between the two groups range between 1- 3 point differences on all three assessments. The ELL students that attended voluntary prekindergarten outperformed the ELL students that did not attend voluntary prekindergarten, see Tables 24 and 25. Therefore the null hypothesis was accepted.

Table 24-Scores of Between-Subject Effects – ELL Students: Attendance vs Non-attendance

	Prekindergarten Attendance	Mean	Std. Deviation	N
Fall	1	137.03	7.840	29
	2	134.25	10.218	28
	Total	135.67	9.113	57
Winter	1	145.76	7.981	29
	2	143.54	11.520	28
	Total	144.67	9.853	57
Spring	1	154.45	9.500	29
	2	153.43	15.536	28
	Total	153.95	12.719	57

Note: 1= ELL prekindergarten attendance; 2 = ELL did not attend kindergarten

Table 25-Tests of Between-Subject Effects – ELL Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Prekindergarten Attendance	Fall	110.451	1	110.451	1.338	.252
	Spring	70.392	1	70.392	.721	.399
	Winter	14.813	1	14.813	.090	.765
Error	Fall	4540.216	55	82.549		
	Spring	5366.275	55	97.569		
	Winter	9044.030	55	164.437		

Note: $p < .05$

Null Hypothesis 11

There is no statistically significant difference in the emergent literacy skills of special education students who did not attend voluntary prekindergarten and the emergent literacy skills of special education students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

A test was performed to determine the main effect of prekindergarten attendance on special education students. The sample used to test the null hypothesis consisted of 81 students with 26 special education students attending voluntary prekindergarten and 55 special education students who did not participate in the voluntary prekindergarten program. Initial 1 (Special Education) X 2 (Attendance) X 3 (Assessments) multivariate tests were done on data which revealed that there was no significant difference in the

emergent literacy skills of special education students who attended voluntary prekindergarten when compared with special education students who did not attend voluntary prekindergarten, F (3, 77) = .227, p = .878. The mean scores on all three assessments were within one-point of each other. The special education students who attended prekindergarten only outperformed those students who did not attend prekindergarten on the spring test, see Tables 26 and 27. Therefore the null hypothesis was accepted.

Table 26-Scores of Between-Subject Effects – Special Education Students: Attendance vs Non-attendance

	Prekindergarten Attendance	Mean	Std. Deviation	N
Fall	1	141.77	9.897	26
	2	142.04	12.888	55
	Total	141.95	11.948	81
Winter	1	148.50	16.317	26
	2	149.53	14.786	55
	Total	149.20	15.199	81
Spring	1	158.50	17.351	26
	2	157.71	15.016	55
	Total	157.96	15.697	81

Note: 1= Special education prekindergarten attendance; 2 = special education did not attend kindergarten

Table 27-Tests of Between Subject Effects - Special Education Students: Attendance vs Non-attendance

Source	Dependent Variable	Type III SS	Df	Mean Square	F	Sig.
Prekindergarten Attendance	Fall	1.260	1	1.260	.009	.926
	Spring	18.630	1	18.630	.080	.778
	Winter	11.043	1	11.043	.044	.834
Error	Fall	11418.543	79	144.539		
	Spring	18462.209	79	233.699		
	Winter	19701.845	79	249.390		

Note: $p < .05$

Summary of the Findings

Chapter 4 included the findings from the statistical analysis of the collected data on the impact of voluntary prekindergarten attendance on the effect of kindergarten emergent literacy skills. Each null hypothesis was either accepted or rejected based on the statistical analysis at the .05 alpha level.

Of the eleven null hypothesis analyzed, five were rejected in favor of the alternate hypothesis. All student groups analyzed demonstrated growth from one assessment to the next during the three assessment cycle that was administered. The results revealed a statistically significant difference in the emergent literacy skills of those students who did not attend the voluntary prekindergarten program when compared to those who did attend the voluntary prekindergarten program as demonstrated by students on the P-MAP assessment. The mean scores favored kindergarten students who did not attend the

voluntary prekindergarten program. The vast majority of the students who did not attend the voluntary prekindergarten program were non-economically disadvantaged students. Further analysis of the data, points toward the significant difference being rooted in socio-economic differences. Statistical analysis was completed to determine if there was a significant difference between Title I schools (see p. 26). The data revealed there was a significant difference in the winter and spring scores. Statistical analysis was completed to determine if there was a significant difference between Non-Title I schools. The data revealed no significant difference. The sample population in each of the schools suggested the difference in the significance of the scores was founded in the economic factors of each of the sample sizes.

All of the null hypotheses which were rejected compared groups along economic divides and racial commonalities. The null hypotheses that were accepted looked at the same group of students (i.e., African-Americans, ELL, special education, Caucasian, Hispanic/Latino) who were economically disadvantaged and their prekindergarten attendance and revealed no significant difference between the two groups. In the null hypotheses that were accepted the voluntary kindergarten program did not significantly impact the scores between the two groups of students. As specific groups of students were compared within their own dynamics, the sample size varied which may have impacted the results.

To the researcher's surprise, the data did not reveal a significant difference in the emergent literacy skills of students who attended the voluntary prekindergarten program. Instead the overall results found in the data analysis offer some insight into the

relationship between economics and emergent literacy skills. Further discussion and implications, along with recommendations related to findings, are presented in Chapter 5.

CHAPTER FIVE: SUMMARY

Introduction

The dawn of accountability on education has prevailed. The need to find the key to academic success for all students was expressed in the No Child Left Behind Act 2001 (NCLB). NCLB was the reauthorization of Lyndon B. Johnson's Elementary and Secondary Education Act of 1965 (ESEA). ESEA gave over a billion dollars annually to cover the cost of educating at-risk children. NCLB placed mandates on states to test all students in Grades 3-8. The law required states to move all students to proficiency by the end of the 2013-2014 academic year and to close the gap between subgroups.

With a realization that interventions after students enter the K-12 system may be too late, many states began to experiment with the implementation of prekindergarten programs to increase student readiness prior to Grade 3 testing. Prekindergarten began to emerge as a viable strategy to promote school readiness and close the achievement gap caused by economic disparity (O'Brien & Devarics, 2007).

The years prior to kindergarten entry are crucial years for emergent literacy. The cumulous effect of environment on language and literacy have been found to play a major role in a student's academic success. In order to limit the effect of economics on emergent literacy skills, prekindergarten has been viewed as an early intervention program. Children entering kindergarten with underdeveloped literacy skills tend to play catchup to their peers who enter schooling with the fundamental skills needed for literacy development (Bailet, Repper, Murphy, Piasta & Zettler-Greeley, 2011; Froiland, Powell, Diamond, & Claire Son, 2013; Gettinger & Stoiber, 2012).

With the notion that schools are held accountable for equalizing the social inequalities of all students regardless of family background, race, ethnicity, or gender, the purpose of this study was to determine the impact of voluntary prekindergarten attendance on kindergarten literacy skills. The impact of voluntary prekindergarten was measured by the Primary- Measure of Academic Progress an assessment developed by Northwest Evaluation Association (NWEA). The assessment was administered three times during the kindergarten year.

Nine hundred ninety-nine kindergarten students from 12 schools across a Mid-Cumberland school district were included in the study. The data was collected from the 2014-2015 academic year. An analysis of the mean scores on all three tests (fall, winter and spring) was used to determine if a statistically significant difference existed based on prekindergarten attendance at one of the voluntary prekindergarten programs of the Mid-Cumberland school system. The means scores were analyzed controlling the following factors: race, economics, ethnicity (Hispanic/Latino), special education and ELL status. Each of the null hypotheses was tested using a multivariate analysis of the data to determine its significance.

Hypotheses

1. There is no statistically significant difference in the emergent literacy skills between students who attend voluntary prekindergarten and those who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
2. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of economically disadvantaged students who

did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.

3. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged students who attended voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
4. There is no statistically significant difference in the emergent literacy skills of African American students who attended voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
5. There is no statistically significant difference in the emergent literacy skills of Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of Caucasian students who did not attend voluntary prekindergarten as measured by P-MAP literacy assessment.
6. There is no statistically significant difference between in the emergent literacy skills of economically disadvantaged Caucasians students who did not attend voluntary prekindergarten and the emergent literacy skills of non-economically disadvantaged Caucasian students who did not attend voluntary prekindergarten.
7. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Caucasian students who did not attend voluntary prekindergarten and the emergent literacy skills of economically

disadvantaged Caucasian students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

8. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged African-American students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged African-American students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
9. There is no statistically significant difference in the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did not attend voluntary prekindergarten and the emergent literacy skills of economically disadvantaged Hispanic/Latino students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
10. There is no statistically significant difference in the emergent literacy skills of ELL students who did not attend voluntary prekindergarten and the emergent literacy skills of ELL students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.
11. There is no statistically significant difference in the emergent literacy skills of special education students who did not attend voluntary prekindergarten and the emergent literacy skills of special education students who did attend voluntary prekindergarten as measured by P-MAP literacy assessment.

Findings

The null hypothesis from the first research question was rejected and the alternate hypothesis was accepted. The research question sought to determine the difference in the

emergent literacy achievement between students who attended voluntary prekindergarten (275) and those students who did not attend voluntary prekindergarten (724). The MANOVA (Table 6 and Table 7) indicated that there was a statistically significant difference in the mean scores on all three administrations of the assessment. Results are supported by the literature which suggested that literacy struggles are more prevalent in non-white children and children whose native language is not English. The same group of children tend to fall into low-socioeconomic brackets (Snow, Burns, & Griffin, 1998). The children who attended the voluntary prekindergarten program were all considered at-risk students. Lee and Burkham (2002) suggested socioeconomic status is strongly correlated with the cognitive skills. Socioeconomics accounts for more of the discrepancy in cognitive skills than other factors such as race/ethnicity, quality child care, family educational expectations, and home reading. The prekindergarten program was viewed as a tool to decrease the academic gap between the two groups of students. With no data provided to determine the academic levels at which students began prekindergarten, gap closure between the two groups cannot be determined.

The null hypothesis for the second research question was accepted. The research sought to determine the significance between the economically disadvantaged (275 students) who attended the voluntary prekindergarten program compared to economically disadvantaged (277students) who did not attend the voluntary prekindergarten program. The MANOVA (Table 8 and Table 9) indicated that there were no statistically significant differences in the mean scores on any of the three administrations of the assessment. The findings are in disagreement with most of the literature reviewed. Magnuson, Waldfogel and Ruhm (2007) and Neilson and Monson (1996) found that participation in

prekindergarten programs produced significantly higher cognitive scores upon kindergarten entry with longer lasting results for children in poverty which is in contrast to the findings of this research question. Lee and Burkham (2002) stated that disadvantaged children fall behind their non-disadvantaged peers at an early age. Children who attended center-based programs tended to enter kindergarten at higher achievement levels which provided the potential ability to reduce the achievement gap. The findings are in agreement with Armor (2014) who found that voluntary prekindergarten program participation did not impact academic performance when tested in kindergarten and first grade.

The null hypothesis for the third research question was rejected in favor of the alternate hypothesis. The research question sought to determine the difference in the emergent literacy skills economically disadvantaged (277 students) and non-economically disadvantaged students (447 students) who did not attend prekindergarten. The MANOVA (Table 10 and Table 11) indicated there was a statistically significant difference in means scores between the two groups with the non-economically disadvantaged outscoring the economically disadvantaged on all three administrations of the assessment. These findings are in agreement with Chazan-Cohen and Kisker (2013) and Lee and Burkham (2002). Their findings revealed that students entering kindergarten from low-socioeconomic backgrounds scored significantly lower than their peers from more affluent backgrounds. The social variables that surround a child in their early years play a key role in their literacy development. The home and parents are key influences. Children who are considered at-risk lack rich experiences that influence their emergent literacy skills (Buckingham, Beaman, & Wheldall, 2014).

The null hypothesis for the fourth research question was rejected in favor of the alternate hypothesis. The research question sought to determine the difference in African-Americans (140 students) and Caucasians (538 students) who did not attend the voluntary prekindergarten program. The MANOVA (Table 12 and Table 13) indicated that Caucasian students who did not attend scored significantly higher when compared to the African-American students who did not attend the voluntary prekindergarten program. These findings are in agreement with Jencks and Phillips (2011) and Fryer Jr. and Levitt (2004) which explored the black-white test score gap that exists prior to students entering formal schooling. Closing the gap is possible but it resurfaces again at about Grade 3 and continues to widen at .10 standard deviation per year. Their findings suggested intervening before school entry in order to cut the achievement gap in half prior to a student's completion of the twelfth grade.

The null hypothesis for the fifth research question was rejected in favor of the alternate hypothesis. The research question sought to determine the difference between students with Hispanic/Latino ethnicity (43 students) who did not attend the voluntary prekindergarten program and Caucasian-Non-Hispanic/Latinos (681 students) who did not attend voluntary prekindergarten program. The MANOVA (Table 14 and Table 15) indicated a statistically significant difference between the two groups. Caucasian students without a Hispanic/Latino ethnicity who did not attend outscored Hispanic/Latino students who did not attend on all three administrations of the assessment. These findings are in agreement with Wang (2008) who called for more ethnic minority studies to look at the inequality of Hispanic students and the academic achievement gap. The small number of Hispanic students in kindergarten limits the ability to test without data bias.

The null hypothesis for the sixth research question was rejected in favor of the alternate hypothesis. The research question sought to determine the difference between economically disadvantage Caucasians (173 students) and non-economically disadvantaged Caucasians (363students) who did not attend. The MANOVA (Table 16 and Table 17) indicated a statistically significant difference in the mean scores of the two groups of students. The non-economically disadvantaged outperformed the economically disadvantaged students. These findings are in agreement with Doggett and Wat (2010) which found that students of low-income families enter school with gaps in their learning. This leads to playing catchup to their peers. Hart and Risley (1995) discussed the vocabulary equivalency of children coming from different economic backgrounds and the disadvantaged of those from less affluent homes.

The null hypothesis for the seventh research question was accepted. The research question sought to determine the difference between economically disadvantaged Caucasians (113 students) who attended versus economically disadvantaged Caucasians (175 students) who did not attend. The MANOVA (Table 18 and Table 1) indicated there was no statistically significant difference between the two groups. These findings are in disagreement with the majority of the literature that supported prekindergarten attendance as a means to improve academic achievement. Magnuson, Waldfogel and Ruhm (2007) and Neilson and Monson (1996) found that participation in prekindergarten programs produced significantly higher cognitive scores upon kindergarten entry with longer lasting results for children in poverty which is in contrast to the finding of this research question. The findings are in agreement with Armor (2014) who found that the voluntary

prekindergarten program participants did not show any impact of prekindergarten attendance when tested in kindergarten and first grade.

The null hypothesis for the eighth research question was accepted. The research question sought to determine the difference between economically disadvantaged African-American students (99) who attended and economically disadvantaged African-American students (90) who did not attend the voluntary prekindergarten program. The MANOVA (Table 20 and Table 21) indicated there was no statistically significant difference in the means scores of the two groups. Relevant literature suggests that differences should be apparent between the two groups being compared. Cunningham (2010) suggested that early literacy skill acquisition can be predicted based on development of skills in prekindergarten. Whitehurst and Lonigan (1998) supported early intervention prior to kindergarten in order to improve early literacy skills of at-risk students. The findings are not in agreement with the literature related to the benefits of attending kindergarten but coincide with the literature on academic challenges of students living in poverty. Lee and Burkam (2002) found students who come from low socio-economic backgrounds tend to score lower when compared to more affluent students. Driscoll (2005) discussed Vygotsky‘s theoretical framework and identified social and cultural contexts as major determinants in a child’s cognitive ability. Due to some of the cultural and social norms of children living in poverty, cognitive development may be delayed.

The null hypothesis for the ninth research question was accepted. The research question sought to determine the difference between economically disadvantaged Hispanic/Latinos (51 students) who attended voluntary prekindergarten compared to

economically disadvantaged Hispanic/Latinos (30 students) who did not attend the voluntary prekindergarten program. The MANOVA (Table 22 and Table 23) indicated there was no significant difference between the two groups of students. The Hispanic/Latino students that attended the voluntary prekindergarten program scored higher on each of the three administrations of the assessment. The difference between the mean scores increased on each administration of the assessment. The findings are not in agreement with student enrollment in prekindergarten producing significant results but support early intervention of Hispanic/Latino children. Garcia and Jensen (2009) suggested that early interventions assists with language barriers that exist and provide extended opportunities for Hispanic/Latino student success. Although not a significant difference, those students who attended prekindergarten out scored with a continuous increase in the mean on each administration of the assessment.

The null hypothesis for the tenth research question was accepted. The research question sought to determine the difference between ELLs (29 students) who attended voluntary prekindergarten compared to ELLs (28 students) who did not attend the voluntary prekindergarten program. The MANOVA (Table 24 and Table 25) indicated there was no significant difference between the two groups of students. The findings are not consistent with the current literature. Smith (2009) suggested that ELL students who attended prekindergarten made greater gains than their ELL peers who did not attend kindergarten. The number of students in the sample size limits the generalizations that can be drawn from the results.

The null hypothesis for the eleventh research question was accepted. The research question sought to determine the difference between special education students (26 students) who attended voluntary prekindergarten compared to special education students (55 students) who did not attend the voluntary prekindergarten program. The MANOVA (Table 24 and Table 25) indicated there was no significant difference between the two groups of students. The findings are not consistent with the current literature. The severity of the special education students' disabilities are not known. The severity of their disabilities may have influenced the findings. White (1985) suggested that early intervention increased students' IQ. Simeonsson, Cooper and Scheiner's (1982) study looked at early intervention of students with environmental and biological challenges. The study revealed statistical evidence to support early intervention. The sample size of this study limits the generalizations that can be drawn from the results.

Discussion and Implications

The years prior to entering kindergarten are regarded as crucial years for emergent literacy. The developmental level and set of skills of students entering formal schooling are a cumulous reflection of their surroundings inside and outside of the home (Chazan-Cohen & Kisker, 2013). These experiences have a profound effect on language and literacy which has been identified as the foundation of all learning. Formal schooling enhances the development and set of skills with which students enter (Crim et al., 2008). Research has found that children who enter kindergarten with gaps in the foundational skills needed for reading tend to remain behind their peers. These literacy struggles persist in elementary school and are predictors of underdeveloped literacy skills

throughout their school years and adulthood (Bailet, Repper, Murphy, Piasta & Zettler-Greeley, 2011; Froiland, Powell, Diamond, & Claire Son, 2013; Gettinger & Stoiber, 2012).

With more than 40 years of government intervention to close the achievement gap, little success has been recognized. Studies continue to find that the achievement gap is present upon entering kindergarten and the gap continues to grow each subsequent year (Wang, 2008). Black and Hispanic children continue to remain at-risk due to their lower income brackets (Portes, 2005). The success of a society has two measures: the literacy level of its children and the disparity that exist in the literacy among the children (Keating & Hertzman, 1999).

Reading is an essential life skill needed to be successful in our society. The ability to read provides opportunities for social and economic advancements. Knowing the advantages that literacy affords an individual, the alarm should be sounding with the significant number of children have difficulties learning to read. These struggles are more prevalently seen in poor children, among non-white children, and children whose native language is not English. With this knowledge at hand, the need to support high-quality preschool is a necessity to support reading success (Snow, Burns, & Griffin, 1998).

In efforts to close the present achievement gap that currently exists in schools within the Mid-Cumberland district, there is a push to expand the voluntary prekindergarten program. With new state standards being implemented and the need to improve the composite scores received by the Tennessee State Department of Education, the current school district is viewing voluntary prekindergarten as a viable option to improve the emergent literacy skills of students prior to Grade 3 testing. In an effort to

determine the effect of voluntary prekindergarten attendance on literacy, this study was conducted to provide some data.

Surprisingly the data did not show a significant difference in student attendance of the prekindergarten program when compared to students who did not attend the prekindergarten program. It is speculative that the ratio between the two groups skewed the results. The number of students who did not attend kindergarten to the number of students who did attend kindergarten represent a 3:1 ratio in favor of students who did not attend. Another factor that was noticed regarding the results was that there was an economic divide. Economically disadvantaged students had the tendency to perform at the same proficiency level regardless of whether or not they attended prekindergarten. Economically disadvantaged students who attended non-Title I schools performed at the same proficiency level as the other students in the kindergarten. On each of the assessments the mean scores increased from the previous assessment. Students did make gains throughout the year but gains were not significant.

When no controls were in place looking at just attendance compared to no attendance of the voluntary prekindergarten program the null was rejected. This is surprising considering the number of economically disadvantaged students compared to the number of non-disadvantaged students is almost an equal number of students. The students who did not attend were significantly higher than those who attended the voluntary kindergarten program. In the historical studies literature review, the programs all had a curriculum based program with outreach programs that involved parents. The current program in place does not have the same mandates that were present in the

historical studies reviewed. These findings are not consistent with relevant literature on the effect of prekindergarten attendance.

The results of this study did not reveal voluntary prekindergarten as a viable strategy as the results did not find in favor of prekindergarten attendance. Looking further into the data that is not analyzed as part of the results, other variables may have contributed to the unfavorable results. For example, only about 27.5% of the student population (275 students) attended the voluntary prekindergarten program. Out of those that attended, 19.6% of the students (54 students) missed more than 21 days of prekindergarten and another 25% of the students (69 students) missed between 13-21 days of prekindergarten. The prekindergarten program does not have an attendance mandate. With the length of the day being shorter than the normal school day and the number of absences reported in the data, daily attendance of the prekindergarten students may have had a significant impact on the effect of prekindergarten on emergent literacy skills.

Limitations

The study had several inherent limitations. First limitation of the study was the limitation of districts involved in the study. The study was confined to one school's district voluntary prekindergarten program and looked at all of the twelve schools. There was no assurance that other districts utilized the same curriculum or similar compatible instrument for measuring emergent literacy skills. There was no randomization of participants in the study. All students who participated in all three administrations of the assessment were included in the study. This skewed some of the sample sizes possibly

giving an advantage to one of the groups of students being compared or not providing a large enough sample of some groups to make a reasonable hypothesis.

The second limitation was neither the attendance rate of students enrolled in prekindergarten nor kindergarten were taken into consideration. The literature review discusses the benefits of attending prekindergarten. In order to receive the benefits of attending prekindergarten, students have to be present. More than 100 students of the 275 students who attended the voluntary prekindergarten program missed more than 13 days of school. Approximately 312 students missed 10 - 21+ days of kindergarten. No tardy data was collected. Tardiness also effects the academic benefits of attending school regularly.

The third limitation was unknown levels of kindergarteners' experience with computers. The test was administered on-line. No assistance was provided for students to navigate the test. Students were given the same instructions and given an unlimited amount of time to complete the test. Economics may have played a role in students' usability of the computers and ability to navigate and choose the appropriate answer choice. Students from more affluent families may have had an advantage over students from poverty. As the year progressed, students became more familiar with the test format and computers.

The fourth limitation was the study only accounted for prekindergarten students who attended the district's prekindergarten program. Students may have attended outside prekindergarten programs, private schools, or daycare. No accountability measure was used to control for this possibility. With the number of private daycares and other primary school settings, the number of students attending an outside agency prior to

kindergarten attendance had the potential to skew the results of the voluntary prekindergarten results found. Students were grouped by attendance of the voluntary prekindergarten program or no prekindergarten attendance.

Recommendations

The present study findings did not correlate with the findings of the majority of literature that students who attended a prekindergarten program exhibited a significant difference in literature scores when compared to students who did not attend a prekindergarten program. There was no significant difference between the students who attended the voluntary prekindergarten program and their identical peers (i.e., economically disadvantaged students who did not attend the voluntary prekindergarten program). Duncan and Magnuson (2013) found that children who attended prekindergarten outscored their peers who did not attend prekindergarten by a standard deviation of .09 to .31. Armor (2014) found both groups scored the same at the beginning of the year but by the end of the year the control group (those who did not attend prekindergarten) outscored the experimental group by two points. The findings speculate that the effects may be offset due to the major development years in primary grades. Issac and Rossel (2008) found that students enrolled in Head Start fell below the national norms although the students made significant gains from previous knowledge levels.

The findings revealed the following groups that did not attend the voluntary prekindergarten program did not meet the mean norm for the end of the year: economically disadvantaged African-American students, economically disadvantaged

Hispanic/Latino students, ELL students who did not attend, and non-economically disadvantaged Hispanic/Latino students. The only group that attended and did not meet the end of year mean score were ELL students. The Hispanic/Latino and ESL group of students who did not meet the end of the year mean score were 3.3 – 4.3 points away from the mean score. These findings identify a need to target the above groups of students for prekindergarten or intervention programs upon school entrance. Although the prekindergarten program did not show significant gains between the comparison groups of similar peers, all groups that attended meet the end of the year norm including special education with the exception of the ELL students. These results signal positive effects of the prekindergarten, just not a statistically significant measure. Future research should be conducted to monitor the academic gaps between the above groups of students and their like peers to determine the longitudinal effect of prekindergarten.

Further research should be conducted at prekindergarten entrance to determine the academic growth of students upon completion of the program. Students may not have scored significantly higher than their like peers but with no data to determine their emergent literacy levels prior to prekindergarten entry, the interpretation of the data is limited. To gain a better grasp of the impact of prekindergarten on the emergent literacy skills of its participants, data needs to be kept and monitored till Grade 3 state tests are administered. Winsler et al. (2008) found that despite starting the year below the national norm, many of the students who attended prekindergarten scored at the 63rd percentile by the end of the year. Just as in this study, the students who attended prekindergarten began the year with a mean score lower than the norm but they did meet the norm mean score by the end of the year.

Future studies need to look at the structure and curriculum alignment of prekindergarten to the new kindergarten standards. The study should determine if the structure and standards requirement for prekindergarten are sufficient for learners who will enter school with an achievement gap. Pianta (2007) found that early childhood education programs have the capacity to alleviate learning gaps of children. These programs must be high quality early childhood programs. Neilson and Monsson (1996) found that students enrolled in high quality programs that target emergent literacy skills made significant gains in their literacy and high quality programs should be made available to at-risk students. With more than 30% of low income children entering school with no print familiarity, there is need to intervene by providing high quality prekindergarten programs for at-risk students (Doggett & Wat, 2010). The research clearly identified the need for quality prekindergarten programs. In order to determine their quality, research should be conducted to determine how they align to kindergarten.

Future research should be conducted to determine other interventions outside of prekindergarten that may be more cost effective and determine the most effective time to begin an intervention. Lally (2010) suggests that by the age of two brain structures for learning are already developed. The social and emotional exchanges that take place in the first two years of life are the building blocks for learning. Hart and Risley's (1995) study focused on the vocabulary exposure and usage of children. At-risk children have a vocabulary that is significantly lower than children of affluent homes. The beginning years of life are critical to the literacy development of children. In order to best serve at-risk children, further research is needed to determine the most effective approach and the time at which to intervene to limit the learning discrepancy identified.

Summary

Development of reading and writing skills between infancy and age five have shown a consistently positive correlation with later reading skills. The National Institute for Literacy (2008) identified six variables as precursor literacy skills. Alphabetic principle, phonological awareness, rapid automatic naming of letters or digits, rapid automatic naming of objects or colors, writing or writing name, and phonological memory are six key variables that maintained their predictive power when accounting for other factors such as socioeconomic status. The combination of these skills build the foundation for success in literacy. The earlier the skills are developed the more efficiently additional skills can be cultured (Missall et al., 2007;Snow et al., 1998).

Gamse et al. (2008) revealed the true intent of the NCLB Act was to enhance the emergent literacy skills of preschool age children with a focus on at-risk children through use of strategies and professional development derived from research-based reading programs. Looking at the use of prekindergarten as a viable intervention to the literacy achievement gap will require further studies into the benefits of daily prekindergarten attendance.

The problem statement and the null hypotheses were revisited in this section. Next, the findings of the data to accept or reject each of the eleven null hypotheses was based on whether the data revealed a statistically significant difference. The third component of this section was the discussion and implication of the study. The fourth sections further expanded on the limitations of the study. The last component of this section identified recommended future research based on the findings of this study.

The purpose of this study was to determine the effect of prekindergarten attendance on emergent literacy skills in a Mid-Cumberland school district. The RIT scores from P-MAP were used to determine a statistically significant difference at the .05 level of significance. The test was administered three times during the kindergarten academic year and statistical significance was calculated for each administration of the test between the two comparison groups using a multivariate analysis. Five of the null hypotheses were accepted and six of the null hypotheses were rejected. Economics appeared to be the determining factor for acceptance or rejection. Economically disadvantaged students did not show a statistically significant difference from like peers who did not attend the volunteer prekindergarten program. This study is important because if prekindergarten is going to be a viable strategy to close the achievement gap between economically disadvantaged students and non-disadvantaged students more research needs to be done looking at the structure and alignment of prekindergarten to formal schooling. This study does not support prekindergarten as a viable strategy for closing the academic achievement gap.

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