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by

Gerardo Leal

April 2015

An Examination of Early Childhood Centers and Traditional Elementary Schools: Which
Instructional Setting Provides the Most Academic Gains for Pre-K Students?

A Doctoral Thesis Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment of the
Requirements for the Degree

Doctor of Education in
Professional Leadership

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DEDICATION

I dedicate this work to my son, Leonardo Tenoch Leal. His thriving energy, imagination, and love provided me with the focus needed to continue my work and interest in early childhood education. His remarkable thirst for knowledge and infinite curiosity made my doctoral journey truly satisfying.

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Anything worth doing takes time and the tremendous sacrifices involved to accomplish the task can make it difficult. Completing this doctoral degree has been one of the most challenging and difficult journeys I have ever undertaken but it has all been worthwhile. I was driven to enroll in this program and to complete this degree due to my passion to continue my education and to learn something new. This drive was fueled by the love of my life and my best friend, Lily, my beloved wife. I want to thank her for all of the countless hours and moments she spent listening to me about early childhood education and statistical analyses. Her advice and words of encouragement helped me to remain focused to complete this degree.

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ABSTRACT

Early childhood education is an important component within the field of education because it is a significant and vital building block for the academic foundation of students. In recent years, research has documented the extensive success and growth of early childhood education for low-socioeconomic, minority, and English language learner students (Henry, Gordon, & Rickman, 2006). As a result of these successes, early childhood centers have been created in the United States primarily for specific communities which require such services. This study focused on determining whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. Data in this study were from the years 2012-2013 and 2013-2014 for bilingual and monolingual prekindergarten students who attended traditional comprehensive elementary schools and those who attended independent early childhood centers (ECC). Monolingual prekindergarten students in independent early childhood centers were compared against monolingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Bilingual prekindergarten students in independent early childhood centers were compared against bilingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Additionally, a cross comparison was made between bilingual prekindergarten students in early childhood centers and monolingual prekindergarten students in traditional comprehensive school

settings in the area of math. Finally, monolingual prekindergarten students in early childhood centers were compared against bilingual prekindergarten students in early childhood centers in the area of math. Results revealed that no statistically significant differences existed in regards to the academic achievement of bilingual and monolingual prekindergarten students in either of the academic settings as measured by the Frog Street literacy and math assessments. The study further revealed that the independent variable (the early childhood center or the traditional school) did not have an impact on the dependent variable (the literacy and math academic achievement of the prekindergarten students).

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CHAPTER ONE

INTRODUCTION

Early childhood education has become an increasingly important and vital part of the academic system. A growing number of academic and educational practitioners are realizing the importance of building a solid academic foundation for the youngest students in this country. Until recently, there has been a trend in the development and implementation of high quality instruction in early childhood education. In his 2013 State of the Union address, President Obama proposed for the nation and Congress to work with states to make high quality early childhood education available for every child in America. This emphasis on legislative action at the federal, state, and local levels to provide high quality early childhood education has fueled the importance of early childhood education and the need to improve upon existing resources and systems. President Obama also predicted there would be a strong cost-effect return on each dollar invested in high quality early childhood education. In essence, he suggested that for each dollar invested, seven dollars would be saved on public and government programs. This high return in the investment of taxpayers' dollars has been an attractive outcome in terms of investing in the future of early childhood education.

The positive benefits of enrolling students in high quality early childhood education have existed for a long time (Barnett, 1995; Brooks-Gunn, 2000; Frede, 1995; Gormly, 2005; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995). Despite the fact there have been studies conducted showing a positive relationship between the benefits of early childhood education, little research has been conducted

which demonstrates and determines the best way to implement and tailor early childhood education for today's needs. Although early childhood education is not a new branch of education, there has been relatively little research to pinpoint its most effective and appropriate uses.

Research has shown there is a huge benefit for students from low socioeconomic and minority backgrounds to enroll early in school (Barnett, 1995). Disadvantaged populations have been shown to benefit the most from quality early childhood programs (Barnett, 1995). Quality programs and resources have been crucial resources toward analyzing the overall effectiveness of early childhood education programs (Barnett, 1995). For instance, investigators have found that students who are introduced early to literacy instruction and academically structured settings have positive and beneficial experiences in high school (Cunningham, 1997). In essence, the earlier the students received academic intervention, the greater the long-term benefits (Whitehurst, 1998).

This study focused on determining whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. Academic settings where the current research first took place have most commonly been known as early childhood centers. These centers served early childhood students the majority of which included prekindergarten and kindergarten grade levels. A smaller number of these centers offered prekindergarten through first grade classes.

Early childhood center schools are present in several districts across the nation (PreK 4 SA, 2014). These academic centers call for separating the early childhood

grades; specifically, placing prekindergarten in an early childhood center separate from the other grade levels. Part of the reason for the establishment of these early childhood centers is the increasing demand for prekindergarten instruction (PreK 4 SA, 2014).

Eight schools were used as the population sample in this study to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. The settings for these schools included the following: four early childhood centers which provided instruction to prekindergarten students only, and four other centers which were traditional schools that provided instruction to students in prekindergarten through fifth grade. All of these schools were located within a two-mile radius. The Frog Street assessment literacy and math data from these schools were analyzed to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs.

Background

Today, most schools in urban cities offer some type of early childhood education; typically prekindergarten or kindergarten classes. Students from various disadvantaged and low socioeconomic backgrounds, possessing limited English proficiency and/or students representing minority groups, can receive some type of early childhood education (PreK 4 SA, 2014). In the ABC Independent School District (ABCISD), for example, 95% of elementary schools currently offer all-day prekindergarten classes for students who qualify. Students qualify, in part, according to the following criteria: (1)

must be four years of age on or before September 1 of a given school year; and (2) live within the boundaries of ABC ISD. Students must also meet at least one of the following criteria: (1) be homeless; (2) be unable to speak or understand English; (3) be economically disadvantaged; (4) be the child of an active duty member of the United States military or one who has been killed, injured, or missing in action while on active duty; (5) be a child who is or ever has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201, Family Code; and (6) NSLP to include all children who meet any eligibility criteria for Head Start, not only those who meet the low income eligibility criteria for Head Start. The Texas Education Code, § 5.001 defines educationally disadvantaged as “eligible to participate in the national free or reduced price lunch program” (Texas Education Code).

ABC ISD has offered prekindergarten instruction since 1984 when House Bill 72 was passed which required the development and creation of half-day education-based programs for four year-old children (House Bill 72). The increasing need for all-day early childhood care and quality early childhood education has influenced schools to find ways to accommodate this growing trend. Within ABC ISD alone, for instance, this need has forced the district to open new facilities in order to deal with the increase in enrollment. In 2002, 39% of the entire Texas population was enrolled in early childhood education (PreK 4 SA, 2014). By 2012, 59% of the entire population in Texas was enrolled in early childhood education (Prek4. SA 2014). These statistics suggest there is a clear need for early childhood education (Barnett, 2012). Initially, the American education system was focused on students who were six years-old and older (Hernandez, 1997). However, as

families have begun to move toward both parents being employed, the expansion of education has extended to students younger than six years of age (Hernandez, 1997). The increase of households with both parents working in the 1950's created a higher demand for early childhood education focused on students six years of age and under (Hernandez, 1997). The percentage of children between the ages of zero and five years of age, living in households with dual-earner families in 1940, was 5% (Hernandez, 1997). In 1989, the number rose to 39% (Hernandez, 1997).

The gradual shift toward an increasing number of United States citizens in the workforce has inevitably led to the demand for schools and other similar entities to provide some type of early childhood care and education for families; especially those living in low socioeconomic communities (Hernandez, 1997). ABC ISD has responded to this increased demand by providing prekindergarten classes to low socioeconomic and English Language Learners (ABCISD, 2014). However, due to lack of funding, the district was only able to offer these classes half of the day in early 2000 (ABCISD, 2014). This meant that the district could only provide prekindergarten classes four hours per day (ABCISD, 2014). Students who were four years-old were exposed to four hours of instruction aimed at cognitive, social, and emotional skills training. As a result of the positive consequences of attending the half-day prekindergarten program, the district observed that if students remained longer in school, academic benefits could double (ABCISD, 2014). Therefore, ABC ISD sought funds to implement this measure through the financial support of private contributions (ABCISD, 2014).

In 2005, ABC ISD began to offer a full-day program for prekindergarten students (ABCISD, 2014). The results of this effort showed that the more exposure a student

received in a structured academic setting the better he or she performed on standardized examinations in the third grade (ABCISD, 2014). Additional benefits for students who were enrolled in early childhood education programming included cognitive, social, and emotional gains (Barnett, 1995).

Throughout the decades, early childhood education advocates and, especially, researchers have demonstrated that children in early childhood programs reap a multitude of benefits which help prepare students for future success in school (Barnett, 1995; Brooks-Gunn, 2000; Frede, 1995; Gormly, 2005; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995). The benefits were especially prevalent among low socioeconomic students in underserved communities (Barnett, 1995). Most of the research has shown that students who have participated in these programs were equipped with school readiness skills, reduced criminal and delinquent behaviors, and showed a greater probability of success in their academic careers, such as reduced dropout rates and improved high school graduation outcomes (Yoshikawa, 1995).

Increased demand and pressure for early childhood programs prompted ABC ISD to accommodate the overwhelming need by providing more early childhood education within the school district. As demand increased and more students were identified as direct academic beneficiaries of ABC ISD prekindergarten program, classroom capabilities and instructional resources became increasingly strained (ABCISD, 2014). ABC ISD soon became aware of the problem of overcrowded schools and classrooms, and, particularly, the slow deterioration in the quality of their prekindergarten program (ABCISD, 2013). ABC ISD resolved the problem by building early childhood education schools (ABCISD, 2014). These centers soon began to educate young students in more

focused and specialized settings attuned to the students' specific developmental needs (ABCISD, 2014).

During the last decade, the district has built six different early childhood centers around Houston to keep up with demand and enrollment. Depending on the location and type of early childhood center, services varied (ABCISD, 2014). For example, some of these early childhood centers offered classes only to prekindergarten students (ABCISD, 2014). Other centers served students who would attend prekindergarten or kindergarten classes (ABCISD, 2014). For the purposes of this study, early childhood centers that offer only prekindergarten classes will be included in the population sample. Most of the centers averaged a total enrollment of 400 to 500 students with individual classrooms averaging 20 to 21 students (ABCISD, 2014). These centers were only a small portion of the district's total schools.

Research has demonstrated that early childhood education is critically important as it establishes the academic foundation upon which subsequent years of schooling are layered (Barnett, 1995; Brooks-Gunn, 2000; Frede, 1995; Gormly, 2005; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995). Although the offering of early childhood instruction is important and the creation of these programs in communities has increased, equally important is the implementation of the most effective model used to ensure the highest student achievement (Gormly, 2005). Studies have shown that the quality of early childhood education programs can positively or negatively affect the academic success of students enrolled in early education programs (Brooks-Gunn, 2000; Gormly, 2005; McCartney, 2007; Reynolds, 2002). Critical and common factors that have been identified in high quality early childhood programs which have garnered

positive outcomes have included, but are not limited to, the following: low student-teacher ratio, adequate time for teachers to reflect and practice new methods and instructional strategies, learner-centered environments, differentiated instruction, and strong relational ties between the school and home to help solidify academic success (Brooks-Gunn, 2000; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995).

One study involved interviewing early childhood educators within traditional education settings and found that the resources, energy, and support from the administration were mainly focused on the upper grades; specifically third to fifth grade (Desimone, 2004). This suggests a difference in terms of quality programming for early childhood students in these two different academic settings (Desimone, 2004). Further, the attention and investment of resources within a traditional elementary school have been found to adversely impact the quality of instruction and education that early childhood students have received within these settings (Desimone, 2004). Within traditional elementary school settings, the norm is to invest a majority of attention and resources to the upper grade levels that perform on standardized tests. This focus on the upper grade levels detracts from the attention and resources that should be invested equally for the early childhood grades. Additionally, in most early childhood centers, there has typically been no tendency to shift or take away from the pool of resources (Desimone, 2004). The main focus of early childhood centers has been to prepare these young students for future academic success regardless of grade level or standardized assessments (Desimone, 2004).

Within the last decade, increased attention and research has been devoted to evaluating the same types of programs that ABC ISD's early childhood centers have created (ABCISD, 2014). In addition, more early childhood advocates have called for different academic settings which would benefit early childhood students and prepare them for sustained academic success in the subsequent years of their schooling (Yoshikawa, 1995). This type of academic setting would effectively meet the social, cognitive, and emotional needs of the early childhood student and equip each with the proper resources and skills necessary to achieve his or her academic potential (Yoshikawa, 1995).

Statement of Problem

Early childhood education has proven to be an important and critical developmental stage, especially for students residing in low socioeconomic communities (Reynolds, 2007). Within the field of early childhood education, more research has steadily accumulated to demonstrate its overall value and importance in education (ABCISD, 2014). This importance has shown its presence in ABC ISD where early childhood education has changed the academic focus and landscape of elementary education. However, there is a gap in current research knowledge related to linking academic benefits and positive outcomes to academic program implementation. More specifically, relatively few studies have analyzed positive performance and outcomes of prekindergarten students in early childhood centers.

The current research may contribute to the growing field of academic knowledge in an attempt to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and

traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. The data utilized in this research were gleaned from 2012-2013, and 2013-2014 years of Frog Street assessment data for prekindergarten students in early childhood centers and traditional schools. Specifically, the data used were mean mastery scores obtained for each student included in the study.

The Purpose of the Study

The purpose of the study was to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. In recent years, the increased student populations have caused local school districts to respond to these population booms by creating independent early childhood centers. The data used was extracted from ABC Independent School District via four early childhood centers and four traditional elementary schools. The specific data employed for this study came from student data collected via Frog Street literacy and mathematics assessments over the course of two years. Data was chosen to make a comparative analysis between the academic performance of prekindergarten students in early childhood centers and prekindergarten students attending traditional elementary schools. Monolingual prekindergarten students in independent early childhood centers were compared against monolingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Bilingual prekindergarten students in independent early childhood centers were compared against bilingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Additionally, a cross comparison was made between

bilingual prekindergarten students in early childhood centers and monolingual prekindergarten students in traditional comprehensive school settings in the area of math. Finally, monolingual prekindergarten students in early childhood centers were compared against bilingual prekindergarten students in early childhood centers in the area of math. Comparison of the data was used to determine if significant differences in academic performance existed for prekindergarten students between the early childhood centers or the traditional school settings.

Significance of the Study

This study may help to formulate a path to resolve an apparent disparity in the data for independent early childhood centers. The outcomes of this study may benefit school districts, large elementary schools, and urban populations comprising large pockets of low socioeconomic communities. The results from the inferential statistical analysis of the data may show the kind of improvement and attention needed to provide quality early childhood education for large school districts. Much like other comparable fields of research, the ever-evolving field of education must also embrace innovation and change within the field of early childhood education.

It is commonly recognized that cities, school districts, and students are much different now than 50 years ago. History shows that the field of education cannot remain static and stagnant among the changing and growing needs of students. The current research study may help to provide a more precise purpose for improving early childhood education and utilizing all resources to their maximum potential.

Primary Research Questions

1. Is there a significant difference between monolingual (English speaking only) prekindergarten students' academic literacy achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?
2. Is there a significant difference between monolingual (English-speaking only) prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?
3. Is there a significant difference in academic literacy achievement between prekindergarten students enrolled in bilingual classes as measured by the Frog Street Assessment compared to those prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
4. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
5. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early

childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early childhood center at the end of the school year?

6. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

Research Design

The research design of the current study was a quantitative, non-experimental, causal-comparative design using inferential statistics to analyze data collected over the course of two years. The data included results from the district's Frog Street literacy and mathematics assessments. The participant data was collected from the district's research department and compared to reach research conclusions. The procedures used in requesting the data adhered to district and academic guidelines. A proposal was sent to the district's research department outlining the scope, purpose, and design of the research study. A request for specific data to be used in the study was presented to both the district and the university. Proposals were reviewed by the appropriate personnel in each entity to ensure that the data request conforms with district standards.

Theoretical Framework

This descriptive study used various theoretical frameworks toward examining the academic benefits of an early childhood center. The developmentally appropriate practice (DAP) and standards-based approach were used to determine how students can benefit

academically and through which specific teaching methods. DAP considers the age of the student and works to create lessons, curricula, and instructional strategies developmentally age-appropriate for each student (Goldstein, 2007). DAP also emphasizes the importance of the developmental stage of the child and works with the child's developmental abilities and skills to create an education that is easily modified and relevant to the student (Goldstein, 2007). This standards-based approach utilizes data and coordinates with governing agencies to create instructional tools and goals for each student (Goldstein, 2007). A standards-based strategy has more of a one-size-fits-all methodology in terms of determining what the child should be learning in the classroom (Goldstein, 2007).

Jean Piaget's theories of developmental psychology was discussed to outline the basic tenets of the developmentally-appropriate approach. In particular, the most significant aspects of Piaget's theories which was discussed are two of the four developmental stages (Morgan, 2006). Piaget theorized that a young child moves through four significant development stages in his or her life, and within each stage there are crucial milestones skill sets which must be triggered for success (Morgan, 2006). These stages include the sensorimotor stage, preoperational stage, concrete operational stage, and formal operational stage (Morgan, 2006). The sensorimotor and preoperational stages will be discussed at length because they are the two stages which directly impact children from birth to seven years of age (Morgan, 2006).

Vygotsky's theoretical frameworks were discussed to emphasize the importance of early childhood development and how these young students learn best. The most relevant of Vygotsky's theories for the discussion of this thesis involved the zone of proximal

development and scaffolding method (Morgan, 2006). Vygotsky's theory of the zone of proximal development espoused a cognitive development analysis regarding the young child and his or her ability to learn (Morgan, 2006). The zone of proximal development also emphasizes the importance of the child's development and maturation before learning can become truly successful (Morgan, 2006). Likewise, scaffolding is a technique used by the instructor to help guide the child throughout his or her learning processes (Morgan, 2006).

Limitations

Some of the limitations which were encountered during the course of this research included the sample of data being used. For example, bilingual and monolingual student body data had different pools due to their disparate population sizes. Bilingual student data included more student subjects in the population in comparison to monolingual student data as evidenced by enrollment rates for the two year period in this study. Data might also be skewed for some of the early childhood centers in the sample where it had classrooms with an additional Head Start instructor. Early childhood centers that had classrooms with Head Start instructors were excluded in order to ensure homogeneity of the data sets. These classrooms generally have one Head Start instructor and additional teaching assistants on a permanent basis which are not present in a regular early childhood classroom.

Other groups that were excluded from the study included special education populations/students, students from the PALS (Preschoolers Achieving Learning Skills) program, or classrooms which consisted of teaching assistants. Selection for each of the groups took into account the intention to create homogenous groups for accurate

comparisons. As a result of this limitation, generalizations beyond the bilingual and monolingual classrooms cannot be applied for these special groups that possess these characteristics.

The data were collected from four early childhood centers and four traditional elementary schools in ABC ISD. This limitation may not provide an accurate depiction of the overall performance of all prekindergarten students in ABC ISD because there are more than 180 elementary schools in the district, thus foreclosing the possibility of generalizing the data. Another limitation is that the district also changed the number of competencies being assessed over the two-year period. Teachers cited the duration of the Frog Street as a problem due to the cumbersome aspect of administering the assessment one on one for each student for measuring twelve competencies. As a result of this concern, the school district subsequently reduced the number of items for assessment purposes from twelve to eight competencies total. For the purposes of this study, the eight exact competencies were analyzed instead of the original twelve to ensure homogeneity between the data sets.

Uncontrolled variables in each of the classrooms were also cited as limitations during the course of this study. At the cornerstone of early childhood education is the concept of the high quality early childhood classroom. While every effort is made to ensure that high quality instruction is implemented in each of the classrooms, varying characteristics can impact the quality of a classroom such as instructional experience of the teacher, district enrollment caps, availability of instructional leadership support, adequate resources and materials, and the school's emphasis on developing parent/community involvement. The critical and common factors that have been

identified in high quality early childhood programs which have garnered positive outcomes have included, but are not limited to, the following: low student-teacher ratio, adequate time for teachers to reflect and practice new methods and instructional strategies, learner-centered environments, differentiated instruction, and strong relational ties between the school and home to help solidify academic success (Brooks-Gunn, 2000; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995).

Definition of Terms

Bilingual Student: Student identified by the school district as Limited English Proficient (LEP) and enrolled in a bilingual classroom.

Monolingual Student: Student that demonstrates English proficiency; for the purposes of this study, this student only speaks, reads, writes, or understands only the English language

Limited English Proficient (LEP): Student possessing limited English speaking, writing, or reading skills as measured by the English Language Acquisition Survey administered through the school district

Early childhood center (ECC): An elementary school that serves grades prekindergarten through possibly first grade.

Low socioeconomic: Populations below the federal government's mandated poverty line.

Pre K: Pre-kindergarten classroom.

Traditional elementary: An elementary school that serves prekindergarten to fifth grades.

Summary

Based on current research, there is no dispute that the benefit of enrolling and exposing low socioeconomic students in a prekindergarten class has positive long-term benefits (Barnett, 1995). It has long been recognized that early childhood education has a significant effect on the students who are exposed to it early in their academic careers. Currently, there is ample research to support the notion that early childhood education has made significant improvements and has rightfully earned its place in the field of education (ABCISD, 2014). However, this causal-comparative study examined the data to determine which academic setting provides the most academic gains for prekindergarten students. First, it described the academic setting of a traditional school where early childhood students learn in a physical setting which served pre-kindergarten to fifth grade students. It then described the academic setting in which early childhood students learn in a separate and specialized school where only early childhood students attend. Through inferential statistical data analysis of the Frog Street literacy and mathematics assessments data over the course of two years for early childhood students, this research may determine which academic setting provides the most academic gains for prekindergarten students.

The following section lays the foundation for the main purpose of the thesis which was to examine the importance of early childhood education and, most importantly, how the independent operation of these programs fare in comparison with early childhood programs in a traditional elementary school setting. The discussion begins by tracking the history and subsequent evolution of early childhood education into how it is known today. This information provided the thesis within a timeline that helped

to drive the discussion into foreseeable predictions of what early childhood education may be in several years. The literature was organized as follows: (1) discussion of the evolution and history of early childhood education; (2) the specific benefits of early childhood education and responsible research and data comprising the field; and (3) a brief comparison of early childhood education versus elementary school settings.

CHAPTER TWO

REVIEW OF LITERATURE

History and Evolution of Early Childhood Education

The first part of the literature review discussed the history and evolution of early childhood education. Early childhood education's intellectual roots and implementation can be traced as far back as medieval times when only certain households would send their young children to nurseries (Hernandez, 1995). Philosophers throughout the centuries endorsed the importance of early childhood education, especially in rearing the intellectual and social development of the young child in society. Political and social philosophers, such as John Locke and Jean Jacques Rousseau, discussed the need for society to focus on the young child and to develop an appropriate education to properly address their cognitive and social-emotional needs (Shonkoff & Meisels, 2000).

During the late Seventeenth century, the world witnessed a remarkable revolution in commerce and manufacturing which gave way to new technology and increased productivity. This revolution, famously known as the Industrial Revolution, shifted the employment workforce and changed the way in which families would exist. Consequently, both parents of the two-parent household slowly began entering the workforce in order to meet the increased demands of society (Hernandez, 1995). As a result of this shift in the makeup of the workforce, kindergarten classrooms were established to address the needs of the young child and of the working household (Hernandez, 1995). The first known kindergarten class established was in Germany by Friedrich Froebel in the early 1800s (Shonkoff & Meisels, 2000). Soon thereafter, the United States imported this new phenomenon to properly meet the needs of the growing

workforce by establishing the first known kindergarten classroom in the country in 1872 (Shonkoff & Meisels, 2000).

As history witnessed more societal and technological changes during the 18th and 19th centuries, the effects of these changes were evident in the composition of the workforce. For instance, the emergence of women's rights in the 19th century drastically shifted the way women held positions in society. Women became increasingly participative and involved in the labor force, thereby creating an increased demand for early childhood education (Hernandez, 1995). As mothers began to become more active in the labor force, the dual-earning family concept emerged. Dual-earning families required care for their children outside of the home so that both parents could work and earn incomes in the new modern society (Hernandez, 1995).

The dual-earning family prompted the field of education to pay close attention to the needs of the young child and develop an education system which would most appropriately address their cognitive and social-emotional needs (Hernandez, 1995). Instructional strategies and methodologies were required to respond to the needs of this new young population in education (Hernandez, 1995). Educational practitioners and academics began to see the need to establish a foundation that would be strong enough and supportive of the young child to pave the way for their future academic success(Hernandez, 1995).

Nurseries and kindergarten classes began to move away from the babysitting model to establish standards and instructional strategies to properly teach the young child. Society witnessed a drastic change in children's attendance at schools and daycare centers. Hernandez's (1995) study found the following:

From 1940 to 1989, the percentage of children under six who needed alternative child care arrangements rose from 8% to 51%. About three-fourths of the increased demand for child care was accounted by dual-earner families, and the remaining one-fourth stemmed from one-parent families with working parents. Since then it increased again to 51% in 1990, but no further change had occurred as of 1993 (p. 150).

Increased attendance at schools and daycare centers urged the government and local school authorities to re-examine the way instruction was being developed for the youngest students in society and to pass legislation which would support these measures (Hernandez, 1995). Different schools of thought also began to appear toward discussing the methodologies and instructional practices for these young learners. For example, proponents of the developmentally appropriate practice theory advocated for a child-centered and learner-driven environment. Conversely, proponents of the standards-based approach promoted the need to push the upper grade curriculum down so that early childhood students could be on track and meet the standards established by local school authorities and the government (Hatch, 2002). New changes in society, coupled with the growing debate on how to educate the nation's youngest learners, became challenges which required the attention of the academic community (Husa & Kinos, 2005).

Historical changes over time in the United States witnessed the development and evolution of early childhood education. These changes have drastically affected the way early childhood practitioners and academics are shaping the field of early childhood education. Charting the course of early childhood education into the future can also be accomplished by examining the different waves of societal changes which have occurred

in the past (Husa & Kinos, 2005). Times, roles, and statuses have changed within American families over the years (Hernandez, 1995). These factors only contribute to the growing need and demand for high quality early childhood education (Hernandez, 1995). The history of early childhood education shows there is an apparent need for the subsequent demands of society, especially amongst the youngest students in the nation (Hernandez, 1995).

Early Childhood Education and its Benefits

The second part of this literature review defined early childhood education and discussed more of its benefits. This discussion included the following topics: (a) an exploration of early childhood education's unique characteristics and its components; (b) proven research as to why it is important especially for disadvantaged families; (c) the common factors that encompass a successful early childhood classroom; (d) current teaching and practices which will prepare the youngest learners in the nation for overall academic success; (e) and cost-benefits analyses of its investment. In addition, early childhood education has recently gained increased importance and relevance in the field of education, especially with better models of tracking data to causally link its success to upper elementary and secondary grade levels. A discussion of various assessments and data measurement tools was used to illustrate the growing trend of early childhood practitioners to corroborate the successes and failures of the early childhood classroom.

Early childhood education has traditionally been comprised of infants to eight year-old children. Prominent developmental psychology theorists, such as Jean Piaget and Lev Vygotsky, have shaped and developed the field of early childhood education to how it is known today (Morgan, 2006). Piaget, most notably, theorized that the young

learner passes through a series of stages and acquires developmental skills pertaining to that particular learning stage (Morgan, 2006). The sensorimotor and preoperational stages of learning are most relevant for the purposes of this discussion and have been of particular historical significance to the field of early childhood education (Morgan, 2006).

Piaget theorized that children in the sensorimotor stage use their five senses to gain a sense of the world around them (Morgan, 1999). Children in this stage are birth to two years of age (Morgan, 1999). The five senses help the young learner in this developmental stage explore, investigate, and learn through sensory actions, such as seeing, hearing, smelling, touching, and tasting (Morgan, 1999). It is imperative during this stage that young learners be provided with multiple learning opportunities to explore their world through the five senses (Morgan, 1999). Developmentally appropriate activities tailored to the learning needs of the young child during this stage are highly recommended to tap into the maximum potential of the young learner (Morgan, 1999).

During the preoperational stage, children between the ages of two and seven years of age typically experience an abstraction of concepts and firmly grasp concrete concepts. The preoperational stage consists of young learners still trying to understand the world around them through an egocentric viewpoint (Morgan, 1999). Young learners in this stage are encouraged to learn through play. Play provides opportunities for learners in this stage to adequately grasp social norms and rules. This stage is also when young learners begin to tap into their own curiosity and understand their inquisitive natures (Morgan, 1999).

Vygotsky (1999) emphasized the importance of play for the young learner and discussed how play is significant to the development of the young child. Like Piaget, Vygotsky theorized that through play, a child can learn social rules and self-regulation (Morgan, 1999). Play allows the young learner to develop through imagination and develop social skills crucial to creating social emotional relationships with others later in life (Morgan, 1999).

Equally important in the field of early childhood education is Vygotsky's theory of the zone of proximal development (Morgan, 1999). This zone involves the developmental skills of the young child and what concepts/skills could be acquired in the zone. During various parts of the zone, learning concepts should be regularly adapted and modified to challenge and meet the young child's learning needs (Morgan, 1999).

Scaffolding is a central concept in regard to the zone of proximal development. Instructors can use scaffolding techniques to appropriately assist and guide the young learner, depending on the particular stage within the zone of proximal development (Morgan, 1999). Understanding the context of early childhood education and the significant theories which have influenced the field will certainly help to illustrate the benefits of early childhood education and fuel the ongoing debate of what is appropriate for these young learners (Bowman, 2000). Today's practitioners and academicians battle with the traditional underpinnings of early childhood education and how the practical implementation of such theories can truly advance and promote the educational interests of this nation's youngest learners (Bowman, 2000). Fortunately, some research has been conducted to date to properly address these debates and balance proven practices with theories (Bowman, 2000).

Sufficient research exists which supports the concept of early childhood education (Bowman, 2000). Multiple studies have been conducted wherein the results of such findings have made compelling arguments to legislative entities toward mandating or creating voluntary early childhood education:

In 2006, Illinois became the first state to legislate voluntary early education to all three and four year old children in the state whose families want them to participate. In time, the program could serve as many as 190,000 children. Similar proposals are being examined in hundreds of communities throughout the United States (Kostelnik & Grady, p. 18).

The savings from investing in early childhood programs have proven to be significant toward reducing certain ills in society, such as juvenile detention and delinquency, adulthood incarceration, reduced expenditures in funding government programs including welfare, special education, and dropout prevention programs (Yoshikawa, 1995).

Longitudinal studies, such as the one conducted on the Abbott Preschool Program, clearly depicts the high return on investment for early childhood programs in low-income communities (Barnett, Jung, Youn, & Frede, 2013). The authors in this article traced the effects of low-income students attending the Abbott Preschool Program in New Jersey and found positive results for the investment of the program (Barnett et al, 2013). Although the article reported on the Abbott Preschool Program in New Jersey, it also included a discussion on prior studies which traced the long-term effects and the cost-benefit analysis of similar programs (Barnett et al, 2013). These authors also cited the results of a study conducted with Michigan's Great Start School Readiness program (Barnett et al, 2013). The study found considerable gains for prekindergarten students

who participated in the program for performance on later examinations, such as in fourth grade and in high school (Barnett et al., 2013).

This Michigan study also finds that state pre-K led to less grade retention through 12th grade and to more on-time high school graduation. The estimated reduction in grade retention generated cost-savings equal to about 40 percent of the cost of the pre-K program (Barnett et al., 2013, p.9).

Similarly, in a study conducted by Heckman and Cunha in 2007, the authors found that early childhood education investment is good economics. Some of the results of their study are depicted in Figure 1 below:

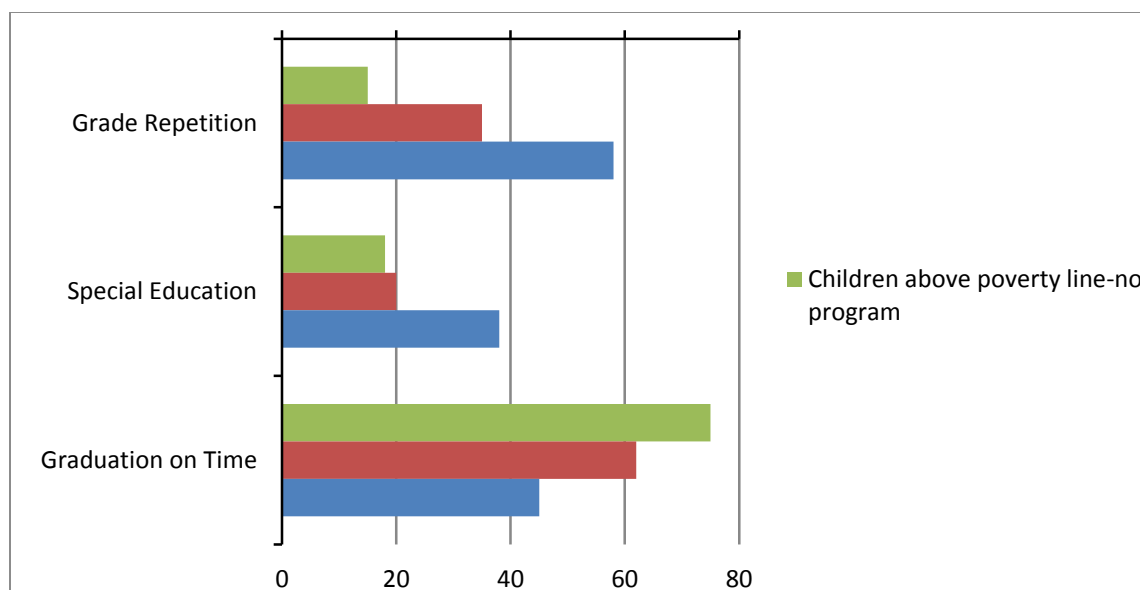


FIGURE 1. *Investing in Early Childhood Education*

The benefits of early childhood education have been shown to be substantial, especially for children living in low-income communities (Dynarski, Hyman, & Schanzenbach, 2011). The savings associated with the high return on investment of these

programs help curb and prevent accelerated rates of grade retention, decrease rates of special education students, enhance dropout prevention programs, and narrow the academic achievement gap (Dynarski et al, 2011).

Taxpayers win when it comes to investing in early childhood education for low-income communities (Dynarski et al, 2011). For instance, the Chicago Child Parent Center found that taxpayers experienced the following benefits in regard to the investment of early childhood education programs in low-income communities of Chicago: \$2.91 savings to taxpayers and government; \$1.07 increased tax revenues; \$1.07 reduced criminal justice costs; and \$.69 reduced remedial education costs (Reynolds et al., 2002). The High/Scope Perry Preschool Project generated similar findings: \$2.51 savings to taxpayers and government; \$.72 increased tax revenues; \$1.04 reduced criminal justice costs; \$.51 reduced education costs (remedial and adult education less increased college costs); and \$.24 reduced welfare payments and benefits (Schweinhart, Barnes, & Weikart, 1993). The chart below illustrates the savings for taxpayers as well as the added benefits of having more productive and fully functioning citizens in society, according to the Perry Preschool Study (2002). Program participants were identified as those who were part of the Perry Preschool Project. Non-program participants were identified as those who did not take part in the Perry Preschool Project.

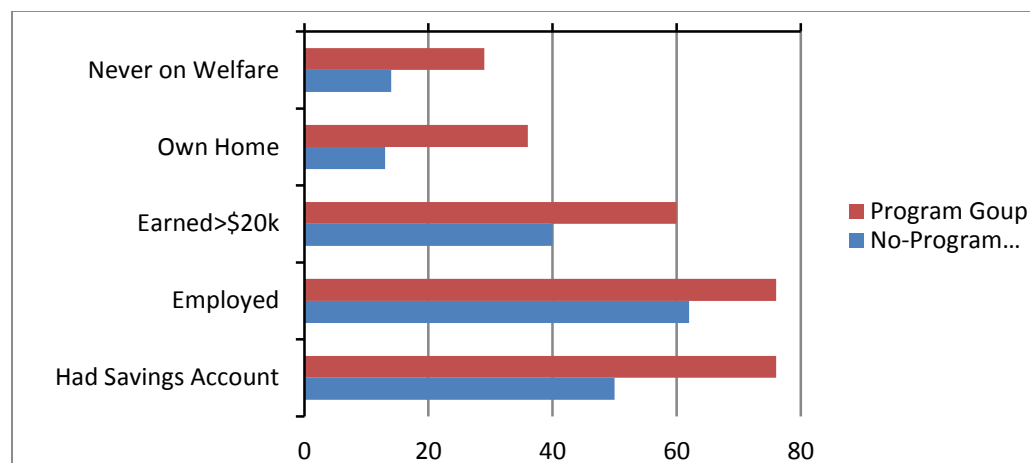


FIGURE 2. *Savings for Taxpayers*

Also, the Abecedarian Early Childhood Intervention program published the following findings: \$1.57 savings to taxpayers and government; \$.81 increased tax revenues (25% of earnings gain); \$.01 reduced welfare (AFDC/TANF) payments; \$.25 reduced special education and other kindergarten-12 education costs; and \$.50 reduced smoking-related and other health care costs (Masse & Barnett, 2002).

Finally, investment in early childhood education programs has resulted in reduced expenditures in the criminal justice system, such as adjudication, juvenile and adult incarceration, and other costs associated with curbing chronic delinquency for our nation's youth (Yoshikawa, 1995). Hirokazu Yoshikawa observed the phenomenon of the social effects of early childhood programs on juvenile and future delinquency in his 1995 article. Yoshikawa (1995) stated that the combination of quality early education and family support services can have great potential positive effects on curbing juvenile delinquency and anti-social behaviors, but should not be viewed as a guaranteed remedy.

Although early childhood education programs are not considered to be the panacea for the chronic delinquency problem disabling the nation, they have been shown to be an effective alternative for reducing the rates of crime and delinquency in the

United States, especially for low-income families (Yoshikawa, 1995). Children from low-income families are at greater risk for possessing characteristics and traits that would later identify them as juvenile delinquents or chronic lawbreakers (Yoshikawa, 1995). Early childhood programs help reduce the risk of children in low-income communities from falling prey to bad choices and decisions that could later affect their social well-being (Yoshikawa, 1995). Results from The High/Scope Perry Preschool Project Study through Age 27 illustrated the strong connection of participating in an early childhood education program with the likelihood of becoming a chronic lawbreaker (Schweinhart et al., 1993), as shown below:

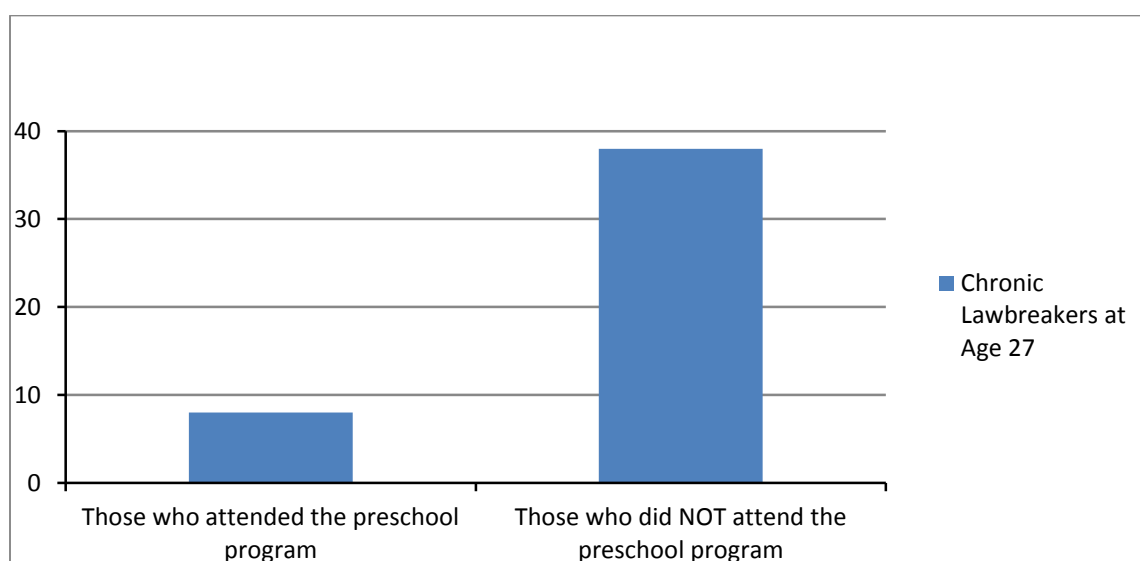


FIGURE 3. *Likelihood of Becoming a Chronic Lawbreaker*

The High/Scope Perry Preschool Study (2002) found that the effects of high quality preschool for low-income families were substantial, especially in regard to reducing the crime rates and the amount of chronic offenders in the community. This outcome suggested that the investment of early childhood education would drastically reduce the expenditures currently spent on adjudicating the convicted, incarcerating

juveniles and adults in the prison system, and decreasing the time spent on processing these cases in the criminal justice system. Early childhood education provides citizens in low-income communities with social and academic skills to prepare them for lifelong success. In addition to reducing the amount of chronic offenders in the community, early childhood education programs have helped graduates of these programs to become productive citizens in society by helping them gain more independence in terms of obtaining long-term employment, purchasing homes, earning higher wages, and avoiding dependence on welfare programs (Kostelnik & Grady, 2009).

The current research on the cost-effectiveness of early childhood programs clearly shows that these programs garner a return on dollars invested (Kostelnik & Grady, 2009). Several longitudinal studies have been conducted to effectively track the results of participants in high quality early education programs (Kostelnik & Grady, 2009). Information exists which could assist educators, administrators, policymakers, and other decision-makers to advocate for the need for such programs, especially in low-income communities (Stamopoulos, 2012). Investing in early childhood education will not completely eliminate the ills of society, but should help to reduce and mitigate their effects (Kostelnik & Grady, 2009).

Several studies have been conducted which demonstrated the effectiveness of early childhood programs for children from low-income communities. Participants in and graduates of these programs have experienced considerable gains in school readiness skills in the areas of reading, mathematics, and writing (Magnuson, Meyers, Ruhm, & Waldfogel, 2004). Other benefits have included increased social skills, reduced rates of grade retention, decreased referral rates for special education and remedial services, and

higher earnings with long-term employment. These benefits support the argument to implement early childhood education programs in low-income communities and to provide students in these communities with the necessary tools and resources to narrow the achievement gap.

The Tulsa Pre-kindergarten program in Oklahoma is a universal prekindergarten program designed to provide high quality early childhood education programs to children in low-income communities through partnerships with area public schools (Gormley & Gayer, 2008). Results from the longitudinal study for test score gains in months for the Tulsa Pre-kindergarten are depicted in the figure below:

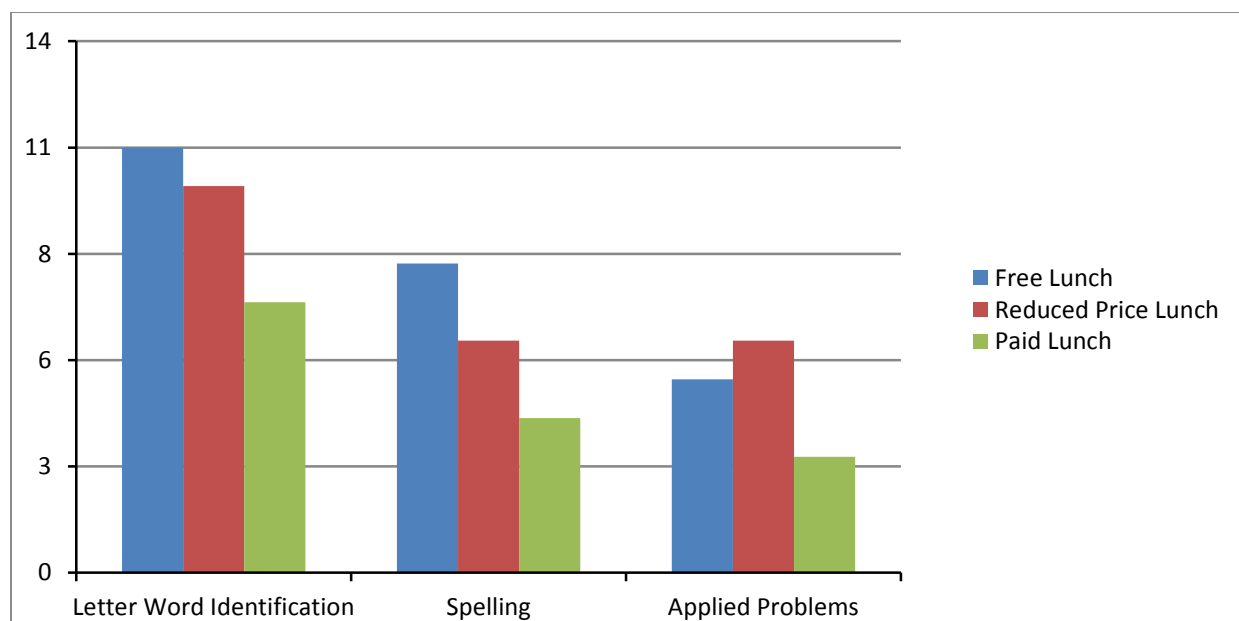


FIGURE 4. *Test Score Gains of Students from Different Socio-Economic Statuses*

The information in the graph above shows the considerable gains of prekindergarten students in the areas of pre-reading, pre-mathematics and pre-writing. According to these results, students from low-income communities benefitted from high

quality programs; which help these students in subsequent years of schooling to achieve academic success.

It is not a mystery or a myth that students from low-income families and communities suffer a greater disparity of knowledge, resources, and learning experiences when they begin their formative years of schooling. Children from low-income families have fewer opportunities to develop their cognitive and non-cognitive skills due to lack of resources and money to prioritize certain activities (Kostelnik & Grady, 2009).

Research has shown that children from low-income families have fewer opportunities to be read to than high-income households. Again, this can be attributed to the scarcity of resources in the low-income community and the lack of education for some parents of low-income students (Hart & Risley, 1995). As a result, children from low-income communities have been shown to possess smaller vocabularies than their high-income counterparts (Vandivere, Moore, & Zaslow, 2000).

The graph below illustrates the disparity between low-income children and children above the poverty line (Heckman & Cunha, 2007, p.5):

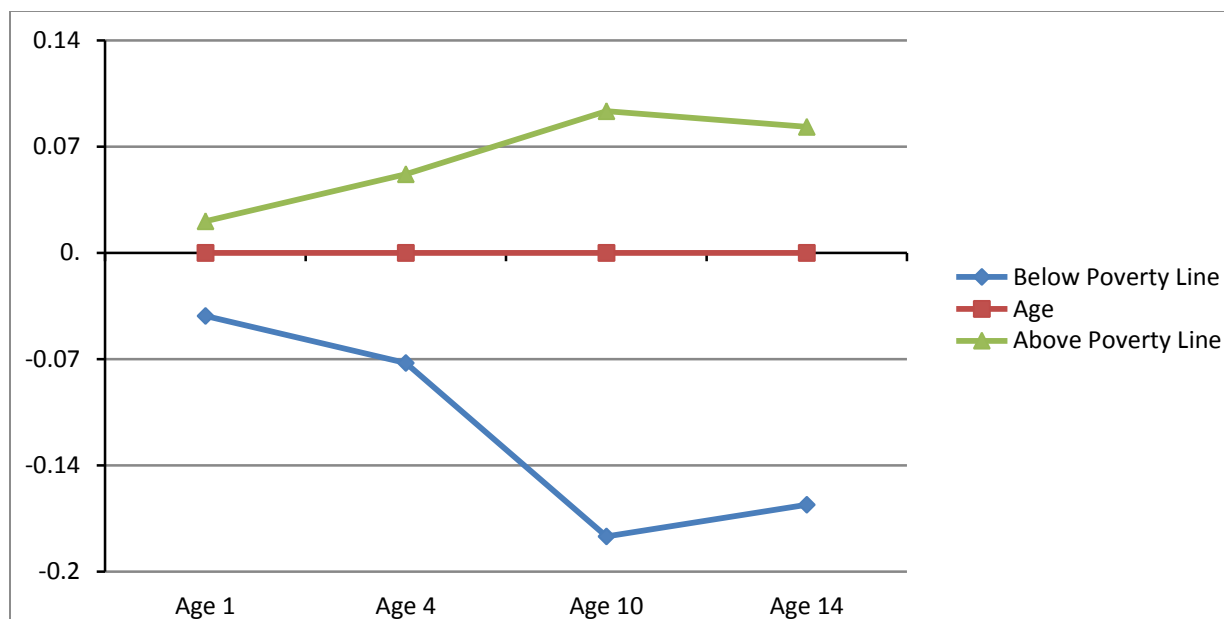


FIGURE 5. *Disparity of Cognitive Skills for Students from Different Socio-Economic Statuses*

As depicted in the figure, students from low-income families struggled in developing their cognitive skills when they began school. Thus, it is imperative that public schools and similar institutions find ways to offer and provide students from these communities with quality early childhood education programs to obtain adequate school readiness skills (Henry, Gordon, & Rickman, 2006). Missed opportunities at home should be supplemented and provided for in public schools for students of low-income families so they can be at or near a level wherein they can compete with children from above-poverty families (Henry, Gordon, & Rickman, 2006).

Several studies have demonstrated the long-term effects of participants in early childhood education programs. One such study conducted by Barnett (1995) reviewed a total of 36 programs examining potential long-term effects on low-income families. This author learned that the participants' intelligence quotient (IQ) scores were influenced by the amount of time the participants spent in early childhood education and found that

these effects typically persisted for many years after their initial participation in the program (Barnett, 1995). The results of the study further showed that the effects were great enough to make an indelible difference in the lives of low-income students, especially in terms of preventing school failure, dropout, identification for special education services, or becoming a juvenile delinquent (Barnett, 1995).

One article discussed the fade-out phenomenon which occurs in subsequent years of school. In the article, “Long Term Outcomes of Early Childhood Programs: Analysis and Recommendations,” the authors discussed this phenomenon. The fade-out phenomenon points to the fading out of IQ gains as students progress through subsequent grades in their academic careers. IQ gains were noticeably apparent immediately after the child completed his or her first year of school, but quickly diminished as the child progresses in school (Gomby, Larner, Stevenson, Lewit, & Behrman, 1995). Gomby, et al. (1995) pointed out that IQ gains should not be used as a single factor to determine the program’s overall effectiveness since other measurable gains and objectives can be achieved. Gomby, et al. (1995) noted that in this fade-out phenomenon, the learning and developmental benefits accrued were substantial as opposed to having no exposure to early education at all.

Students from low-income communities benefit from early childhood education in helping them to develop and obtain cognitive skills (Gomby, et al. 1995). Studies have shown that participants in these types of programs acquire the resources and assistance they need for effective cognitive development (Gomby, et al. 1995). With the preparation obtained from early childhood education programs and the emphasis to improve upon school readiness skills, students from low-income communities can compete on a more

level playing field (Gomby, et al. 1995). Research has demonstrated that early brain development grows at a rapid pace, and the earliest years of a child's intellectual life is critical to later success (Kostelnik and Grady, 2009).

Performing a simple task, such as reading to a child during his or her early years, can produce substantial benefits in terms of brain growth and development (Kostelnik and Grady, 2009). For instance, simply reading to a child can spark new connections in the brain and strengthen existing ones (Kostelnik and Grady, 2009). Obviously, this type of impact can have a lasting influence on the child's young brain (Shore, 1997). This observation of the young child's brain and analyzing cognitive development provides the field of early childhood education with the urgency to offer quality early childhood programs for students who are at a higher risk of failure due to scarce resources and learning experiences (Shore, 1997). It is evident that early childhood education can influence and affect the young learner's brain toward acquiring appropriate cognitive development for subsequent success in children's academic careers (Shore, 1997).

Children from low-income communities who attended quality early childhood programs experienced positive changes in their social and economic well-being as well as in their academic posture (Yoshikawa, 1995). As cited in the aforementioned section, regarding the cost-benefit analysis of investing in early childhood education, participants of these programs have a higher likelihood of graduating high school and entering the workforce with higher incomes, and are less likely to be identified for remedial services, such as special education and dropout prevention programs (Yoshikawa, 1995). Low-income families have been shown to be more susceptible to adopting at-risk behaviors, such as bullying, initiating fights, engaging in physical cruelty to people or animals, using

weapons, stealing, participating in fire-setting behaviors, engaging in rape, exhibiting chronic truancy, running away or lying, breaking into homes or automobiles, and destroying property (Yoshikawa, 1995). Sufficient evidence exists to show that early childhood education programs can curb these negative behaviors and prevent children from low-income families from falling victim to increasing crime and juvenile delinquency statistics (Yoshikawa, 1995).

A crucial factor for determining whether early childhood education programs were effective for low-income communities has involved examining the home environment and how much parental involvement is provided for the child (Barnett, 1995). If the home environment lacks support and resources to prepare the child for school or enhance cognitive development, the early childhood education program must do much more to supplement what is lacking at home (Barnett, 1995). In this sense, the home environment can be deemed as an outcome determinant since what the child has or experiences at home can shape his learning experiences at school (Barnett, 1995). Parental involvement is also outcome-determinative because it addresses the social and emotional health of the young child (Barnett, 1995). If not enough parental involvement exists in the child's home setting, it presents a new set of challenges for the young student at school (Barnett, 1995).

Research has shown that parental involvement has a strong influence on a child's success in education (Diamond, Justice, Siegler, & Snyder, 2013). Parental involvement provides the young child with social and emotional support and scaffolding to help the child master difficult academic concepts and skills (Diamond et al, 2013). For most low-income families, parental involvement has been a challenge because families frequently

involve dual-earners, making it more difficult for parents to be actively involved in their child's education (Diamond et al, 2013).

An added benefit for low-income students is the ability to receive social services, such as health screenings and nutritious meals (Gomby et al., 1995). Low-income communities suffer a greater amount of disparity toward obtaining social and economic resources (Gomby et al., 1995). Early childhood education programs help to bridge the gap for these communities by providing regular health screenings, such as vision and hearing tests, as well as ensuring that all students are properly vaccinated before enrolling in school (Gomby et al., 1995). In addition, students from low-income communities have been found to have the opportunity to receive nutritious and complete meals at facilities which offer early childhood education programs (Gomby et al., 1995).

Research has shown that balanced and nutritious meals positively affected and helped cognitive development (Tanner & Finn-Stevenson, 2010). Brain development is critically important in the early years of a young learner's life because it forms and paves the way for the subsequent acquisition of cognitive skills (Tanner & Finn-Stevenson, 2010). Lack of nutrition or being seriously malnourished can inhibit the synapses of the brain toward functioning properly (Tanner & Finn-Stevenson, 2010).

Studies around the world have observed the damaging effects of malnutrition in brain development, such as third-world and impoverished countries. Malnutrition can hinder height growth and productivity (Alderman, Hoddinott, & Kinsey 2003). With this knowledge and information, it is evident that early childhood programs can do much more for young learners from low-income communities, especially in terms of helping

them properly acquire cognitive skills and develop their brains in a healthy way (Alderman et al, 2003).

Although early childhood education can be deemed effective on the surface, there are distinguishing characteristics which separate a successful high quality classroom from a low quality one. The unique components of early childhood education clearly set early childhood education apart from other grade levels (Kostelnik and Grady, 2009). This concept can be fairly attributed to the unique development and growth of the young child (Kostelnik and Grady, 2009). Young children's brains are still in the initial stages of acquiring knowledge and forming basic functions while simultaneously experiencing a rapid growth in cognitive and brain development, which must be catered to accordingly (Kostelnik and Grady, 2009).

One of the most common characteristics of a high quality classroom is student-teacher ratio and class size. Early childhood education students have been found to require a great deal of attention (National Institute of Child Health and Human Development, 2002). The balancing of student-teacher ratios in the classroom can help alleviate some of the stress in a classroom (NICHD, 2002). Low student-teacher ratios provide teachers with the ability to offer students more individual attention, especially if a student is struggling with a particular concept (NICHD, 2002). Young learners at the early education age are experiencing rapid brain and cognitive development (NICHD, 2002). Teachers who allot more individual time to each student help to circumvent frustration and stress the student may encounter in the learning process (NICHD, 2002). Students and teachers can interact in a productive manner and teachers can provide

tailored feedback to individual students to accelerate the learning process (Kostelnik & Grady, 2009).

Comparing the American model of early childhood education with other countries around the world, one study found that high student/low teacher ratios were equally, if not more successful, than the ratios in the United States (Boocock, 1997). Classrooms in countries such as France and Japan were typically comprised of approximately 30 students to one teacher and have enjoyed successful academic results (Boocock, 1997). Of course, many outlying factors might have also contributed to the success of the high student-low teacher ratio, such as more support in the home and/or tasks and activities which directly correspond to the individual child's abilities. Boocock (1997) cautioned that one should examine each scenario on a case-by-case basis. In other words, what may work for a system in one particular country might not be effectively mirrored in another country without taking into account other factors (Boocock, 1997).

Experienced professionals and teachers have been highly sought after in the field of early childhood education. A high quality classroom cannot function properly without having the right individuals to steer it in the right direction (Kostelnik & Grady, 2009). Teachers and staff in early childhood education should be well-prepared and appropriately compensated (Kostelnik & Grady, 2009). This normally applies to the breadth of knowledge and experience of early childhood teachers and staff (Kostelnik & Grady, 2009). Research has demonstrated that teachers who lack experience and knowledge about the development of the early young child can wreak devastating effects on the young learner (Early, Maxwell, Burchinal, Alva, Bender, Bryant, & Zill, 2007). Teachers who are knowledgeable about how the young brain functions and how cognitive

development can be stimulated will exact more positive effects on young learners in an early childhood classroom (Early et al., 2007).

Teachers who are ill-equipped in the area of early childhood education may lack the knowledge to utilize instructional resources and materials to effectively deliver high quality instruction (Maxfield, Ricks-Doneen, Klocko, & Sturges, 2011). Instruction and learning activities should be developed in accordance with the appropriate level of activities the young learner can manage (Maxfield et al, 2011). Likewise, it is important for administrators to also have a grasp of and a solid foundation in early childhood education (Maxfield et al, 2011). Administrators unfamiliar with the basic tenets and concepts of early childhood education have been less successful at coaching their teachers and staff as well as providing them with the necessary support to flourish in the classroom (Frede, 1995). Thus, it is imperative that all professional individuals involved in an early childhood education program be well-prepared and possess the knowledge and experience to work with the nation's youngest learners (Zaslow, Tout, Halle, Witaker, & Lavelle, 2010). Again, a poor quality program can have serious ramifications as Kostelnik and Grady (2009) observed. These investigators found that young children who have poor quality early learning experiences will be more susceptible to behavior problems, display increased aggression, encounter delays in cognitive and language development, and show overall reduced academic progress over time.

Coupled with the need to attract experienced and well-prepared teachers and staff in the early childhood classroom, the administrators must also take into account children's ongoing professional development needs (Frede, 1995). Studies have shown that the lack of professional development and attention to the professional needs of early

childhood teachers and staff can adversely impact students in the classroom (e.g., Reynolds et al., 2002). Again, the experienced and well-trained administrator in the early childhood education setting would be more inclined and tuned into the professional development needs of his or her staff (Kostelnik and Grady, 2009). Lacking the proper knowledge and experience to identify low quality teachers can be detrimental to the young learner. Early childhood classroom teachers and staff require various types of support to assist them toward making their classrooms highly functional and of high quality (Byington, 2011).

Administrators with the knowledge and experience of an early childhood practitioner can address the needs of his or her instructional staff as well as provide appropriate coaching strategies to support the teacher (Byington, 2011). Strong leadership, coupled with attentively gauging the needs of the instructional and support staff, can assist the administrator in identifying relevant and beneficial professional development opportunities (Kostelnik & Grady, 2009). The right support and structure contributes to the success of establishing high quality early education classrooms (Kostelnik & Grady, 2009).

Student interventions are an important element in high quality early childhood education classroom (Frede, 1995). Interventions serve to address challenges and difficulties an individual young learner might encounter in the classroom (Monthly Labor Review, 2011). Skilled teachers work with smaller groups of students to review concepts or re-teach a difficult concept in a different way (Monthly Labor Review, 2011). For the young learner, the more individual attention that is provided to him or her, the better the

chances of developing cognitive skills and completing age-appropriate activities (Kostelnik & Grady, 2009).

Small group instruction settings and individual intervention systems assist the teacher in identifying students with average and below average learning abilities (Kostelnik & Grady, 2009). These techniques also help the teacher group students with similar skill sets and modifying instructional strategies as necessary (Kostelnik & Grady, 2009). In a given early childhood classroom, a multitude of learning styles and abilities can exist, thereby prompting the early childhood teacher to accurately assess the learning environment and develop lessons and activities as developmentally appropriate (MacDonald, 2007). Today's high quality early learning classroom consists of individualization and differentiated instructional strategies (MacDonald, 2007). Gone are the days in which early childhood instructors implement one-size-fits-all strategies and rote learning activities.

During the early years of a child's education, parent involvement can be a determinative factor for the young student's academic success (Kostelnik & Grady, 2009). An inclusive parent involvement program allows for parents and instructional teachers and staff to work together in a collaborative fashion (Kostelnik & Grady, 2009). Research has shown that the parent involvement component can be a crucial factor in successfully educating our youngest students (Kostelnik & Grady, 2009).

It has been demonstrated that strong parent involvement can positively affect the academic performance of a student (Harvard Family Research Project, 2006). The Harvard Family Research Project in 2006 conducted a study that reported on the significant and positive effects of family involvement for the early young child. A

collection of studies was aggregated to report on the causal link between family involvement and its effects on the child's academic career in school (Harvard Family Research Project, 2006). Especially for young children, this project showed it is essential to have a close and emotional bond with parents in order to fortify academic progress in the long run. (Harvard Family Research Project, 2006) The Harvard Family Research Project (2006) also conducted an extensive study that observed the effects and positive outcomes of a strong parental involvement and early childhood education. The project found that positive family experiences, nurturing relationships in the home, and continuing the learning in the home helped to positively affect a young child's learning experiences. The study also proposed that support in the classroom must be extended to the home. Teachers can work with parents of low-income students to provide practical strategies toward scaffolding new and difficult learning concepts (Kostelnik & Grady, 2009). The chart below from The Harvard Family Research Project (2006) illustrates how strong family involvement can influence the young child's learning behaviors:

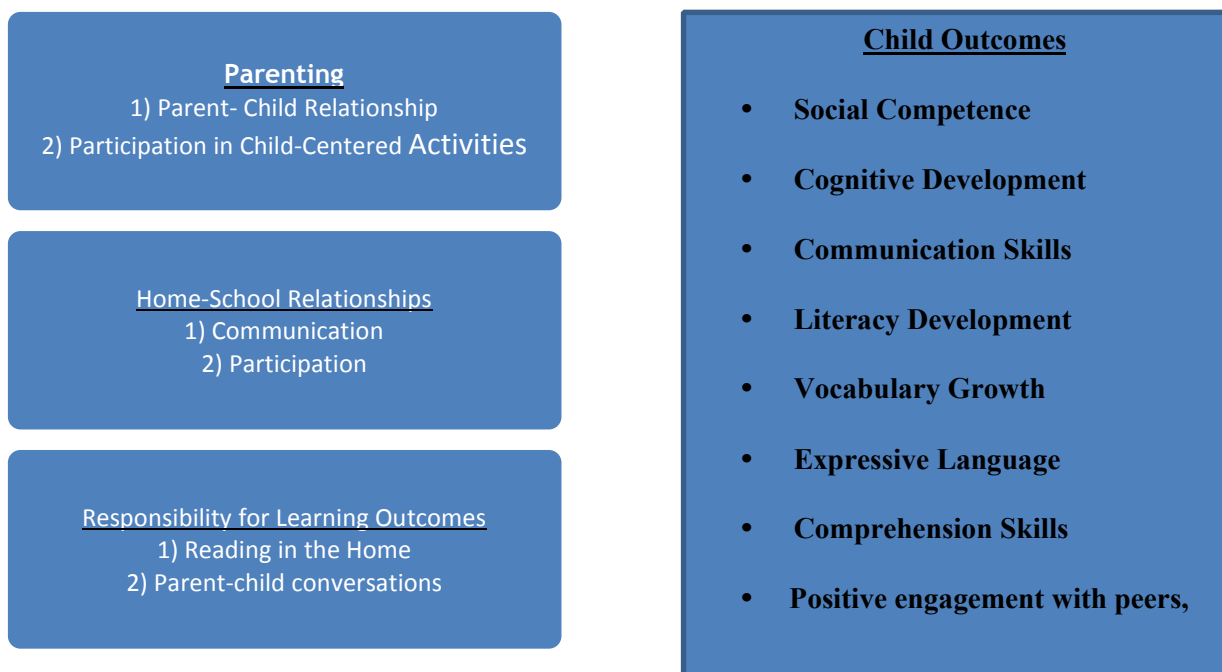


FIGURE 6. *Effects of Parent Involvement on Child's Cognitive and Social/Emotional Behavior*

Teacher behavior has been cited as an important element in the high quality classroom (Frede, 1995). Effective teachers will take advantage of teachable moments throughout the day and capitalize on these moments to facilitate the learning process for young students (Frede, 1995). Examples of positive teacher-student interaction include: (a) establishing warm, respectful, understanding, and friendly relationships toward students; (b) listening actively to children; and (c) providing comfort and support to help students become successful in their social interactions (Kostelnik & Grady, 2009). It is common knowledge that humans react positively to nurturing and friendly relationships. The same holds true for early childhood students, especially for those students in low-income communities (Kostelnik & Grady, 2009). Students who come from disadvantaged

backgrounds will most likely have fewer positive experiences with relationship-building than students in families living above the poverty level (Kostelnik & Grady, 2009).

Early childhood practitioners can prevent deterioration of a child's ability to foster and develop social relationships amongst family and peers (Diamond et al., 2013). For instance, the early childhood teacher can help to facilitate the learning process and assist students in grasping difficult concepts by assuming a nurturing role. The more support and encouragement a young early childhood student receives in the classroom, the more likely it is that he or she will enjoy positive learning experiences and achieve academic success (Diamond et al., 2013). Positive student-teacher interactions will also contribute to the academic success of the early childhood student. The nature of the teacher's feedback and how the teacher assists the student in getting through a difficult learning task can be an effective measure of the quality of the classroom (Diamond et al., 2013). Again, Vygotsky's theory of scaffolding plays a critical role in how the student learns, and especially how the teacher utilizes the scaffolding to assist the student in obtaining academic success (1999).

The overall classroom environment is an important component of the high quality early childhood classroom (Johnson, 2010). The early childhood education classroom is unique because it comprises various elements aligned with the cognitive development of the young learner. Early childhood classrooms typically display vivid colors and literacy—visuals to spark the young mind (Johnson, 2010). These types of visuals help to stimulate the young brain and motivate learning. Students in the early childhood classroom usually have more independence and exploratory time to be in control of their learning (Johnson, 2010). Effective teachers use good judgment as to when to provide

guidance and overt control in the early childhood classroom, providing students with more autonomy and freedom over their learning processes (Kostelnik & Grady, 2009).

Visitors to most early childhood classrooms may notice many distinguishing characteristics. For example, the furniture may be selected to appropriately meet the developmental needs of the young child (Kostelnik & Grady, 2009). Tables and chairs are typically placed in the classroom for the purpose of small group instruction and for allowing the young student to sit comfortably while performing tasks and completing assigned activities (Kostelnik & Grady, 2009).

Rows of desks are gone in the productively structured early childhood classroom (Kostelnik & Grady, 2009). Students typically work in various areas of the room within separate workstations which meet their developmental needs (Diamond et al., 2013). Teachers usually work with small groups of students at a time on different levels, and further enhance the learning process through a more engaged and interactive environment (Diamond et al., 2013). Essentially, early childhood classrooms are very learner-centered and driven, and teachers act as facilitators of the learning process (Diamond et al., 2013).

The early childhood curriculum is unique because it is tailored for the early young learner and his or her developmental abilities (Kostelnik and Grady, 2009). Certain curricular considerations should be taken into account when instructing this population. For example, the curriculum is developed and implemented in a way that meets the developmentally appropriate needs and abilities of the young learner (Kostelnik and Grady, 2009). The early childhood curriculum involves all of the organized experiences, activities, and events—both direct or indirect—that occur in settings designed to foster young children’s learning and development (Kostelnik and Grady, 2009). This type of

curriculum includes: (a) the content and skills children are to learn; (b) activities, strategies, and materials teachers use to address curricular goals; (c) interactions among children and adults as well as among and between peers; and (d) the context in which teaching and learning occur (Kostelnik et al., 2007). In addition, curricula must be purposeful, intentional, and stipulate clear goals and objectives (Kostelnik and Grady, 2009). Early childhood curricula today are evidence-based with proven strategies and methods to assist teachers in the classroom in instructing this unique population (Kostelnik and Grady, 2009). Practitioners also consider the individual learning abilities and preferences of each child, and design lessons and strategies which are inclusive for all learners (Kostelnik & Grady, 2009).

There are certain trademark characteristics of an early childhood classroom. The implementation of the typical early childhood curriculum consists of a diverse array of activities to keep the young learner engaged (Kostelnik and Grady, 2009). The six most common activities seen in an early childhood classrooms are: explorations, guided discovery activities, problem solving activities, discussions, demonstrations, and direct instruction (Kostelnik & Grady, 2009). Exploration provokes the curious and the inquisitive nature of early childhood learners. Setting out various activities and projects for students within this age group can help to trigger self-initiated learning processes. The teacher plays a role in exploration activities by being attuned to the developmental needs of the students and developing activities which challenge and engage them (Kostelnik and Grady, 2009). Exploration activities also provide students with the opportunity to arrive at multiple conclusions instead of been restricted to one (Kostelnik and Grady, 2009).

Guided discovery activities utilize the scaffolding technique wherein the teacher serves more as a facilitator (Kostelnik and Grady, 2009). Students still retain much of their independence during these activities, but also require some assistance from the teacher to be guided through the learning process (Kostelnik and Grady, 2009). Some examples of students' behavior during guided discovery activities include: (a) observing and recalling; (b) interpreting, comparing, and contrasting; (c) raising questions; and (d) pursuing answers of their own making (Kostelnik & Grady, 2009). Teacher behaviors include modeling how to find answers, provide information and tools, offer opportunities for practice, and challenge children's thinking (Kostelnik & Grady, 2009).

Problem solving activities are an elevated form of guided discovery (Kostelnik & Grady, 2009). In this type of learning strategy, students are prompted to use higher level thinking skills and freely explore multiple solutions to the problem (Kostelnik and Grady, 2009). In addition, students are encouraged to use their investigative and inquisitive skills to actively work on problems (Kostelnik and Grady, 2009). Some student behaviors for this activity include hypothesizing about why something happens, gathering information, making predictions, constructing explanations, brainstorming, generating solutions, evaluating results and plans, making plans for new experiments or approaches, and communicating results (Kostelnik & Grady, 2009). Teacher behaviors for problem solving activities include the following: (a) planning simple investigations to enhance children's thinking; (b) analyzing, interpreting, understanding, and reasoning; (c) choosing problems which are concrete and observable; (d) taking advantage of naturally occurring situations to enhance children's problem solving skills; and (e) avoiding solving children's problems for them (Kostelnik & Grady, 2009).

Discussions provide opportunities for young learners to engage and interact in joint conversations with the teacher (Kostelnik and Grady, 2009). The teacher guides the discussion and plans it thoughtfully and purposefully so the students can participate in the discussion with the intent of identifying some goals to be achieved. Discussions are an important aspect of the early childhood classroom because it allows for the young learner to develop social, mechanical, and grammatical rules of conversing and discussing topics (Kostelnik & Grady, 2009). Examples of student behaviors during discussion activities include talking, listening, commenting, posing ideas, coming to agreements, summarizing, building concepts, and adjusting their thinking to accommodate new information that does not fit their old notions (Kostelnik & Grady, 2009). Additional teacher behaviors in this model include gaining insights into children's thinking, providing information, and, sometimes, keeping records for children to refer back to at a later time (Kostelnik & Grady, 2009).

Demonstrations help the teacher to model instructions or illustrate how an activity can be completed (Kostelnik and Grady, 2009). Teachers use demonstrations to explain difficult concepts and to model how the activity can be completed (Kostelnik and Grady, 2009). Modeling is important because it provides the students with the opportunity to observe and imitate how the learning objective is applied (Kostelnik & Grady, 2009). Teachers and other students who model behavior also use demonstrations as a guiding and scaffolding tool which can provide a preview of something to occur later (Kostelnik & Grady, 2009).

Direct instruction lends the teacher more autonomy and control over what material and concepts will be covered (Kostelnik and Grady, 2009). Teachers use direct

instruction to help students through difficult material and guide them to a single correct response (Kostelnik & Grady, 2009). Leading students to a single correct response is the distinguishing factor of direct instruction over other activities observable in an early childhood classroom (Kostelnik and Grady, 2009). Children have less control when direct instruction is implemented (Kostelnik and Grady, 2009). This does not necessarily mean that direct instruction should never be used, but, instead, suggests that direct instruction should be used sparingly with regard to the other ways in which learning concepts can be taught to the early childhood learner (Kostelnik and Grady, 2009). Proper use of direct instruction does not entail merely telling students what they need to know (Kostelnik and Grady, 2009). Instead, it can also be used as an interactive and engaging tool that prompts students to think more critically and utilize higher level skills to respond to the teacher's inquiries (Kostelnik and Grady, 2009). Direct instruction also allows the teacher to immediately assess the student's progress and modify instructional practices if necessary (Kostelnik & Grady, 2009).

One of the most important content areas in early childhood today is literacy (Cunningham & Stanovich, 1997). Research has shown how early literacy skills can impact a young learner's success in education (Xue & Meisels, 2004). Emergent or early literacy skills assist the young learner to acquire the cognitive development needed for literacy (Christian & Bakker, 2004). Teachers in an early childhood classroom conduct a myriad of activities which can help the young learner to acquire such skills (Soderman Gregory, & McCarty, 2006).

Oral language and development during the early years of school can assist the child in acquiring academic success and ease in transition from one grade level to the

next (Soderman Gregory, & McCarty, 2006). Examples of such activities include oral storytelling and role playing, using books to take a picture walk to develop early literacy skills, such as fluency and vocabulary, singing songs with rhymes to enhance the child's skills in identifying grammatical patterns and acquiring basic language mechanics, and introducing new vocabulary words to cite the phonetic and phonological structures of oral language (Soderman et al., 2006). These types of activities can prepare the young learner for eventual success and, especially, helps early childhood students from low-income families gain equal footing in their academic careers (Soderman et al, 2006). Typically, students from low-income families have scarce opportunities and resources to acquire literacy skills (Soderman et al, 2006). Students from low-income families have fewer opportunities to engage in storytelling, holding and looking at a book, or enhancing their vocabulary skills through books (Soderman et al, 2006). Thus, it is imperative that early childhood centers be properly equipped to educate students from low-income communities by delivering instruction and activities which will help to develop emergent and early literacy skills (Soderman & Farrell, 2008). A typical early childhood classroom will include the following:

Teachers are advised to have a book area and to include books in every activity center in the classroom-books on machines, transportation and building in the block area; cookbooks and home construction books in the pretend play area; books about artists, color, and design in the art area; number books and books about nature in the math and science area (Kostelnik & Grady, 2009, p. 243).

Within the field of early childhood education, there are divergent approaches in which literacy can be taught to early childhood students. Two prominent schools of thought are the whole language approach and the phonics approach (Xue & Meisels, 2004). Early childhood practitioners have debated and struggled with whether one approach produces more beneficial results than the other (Xue & Meisels, 2004). There is also research that has demonstrated that the hybrid of the two approaches could yield positive benefits for the early childhood student (Xue & Meisels, 2004).

The whole language approach rests on the theory that the whole word and the meaning of the word are important to foster early literacy skills to the young learner . This approach works to help students understand the text and the meaning of the words as opposed to breaking down the word and decoding it (Xue & Meisels, 2004). Teachers devise lessons and activities that are more child-centered and focus on meaning construction rather than decoding to sound (Xue & Meisels, 2004). Examples of the whole language approach activities are choral reading, taking a picture walk with the book to derive meaning from the story, and discussing the words and how the meaning of each of the words help to comprise the story (Xue & Meisels, 2004).

The phonics approach to reading focuses more on the individual letters and components that comprise the word (Xue & Meisels, 2004). Phonemic awareness, recognition of the alphabetic principle, word recognition, decoding, and the relationships between sounds and spelling are the guiding principles for phonic approach advocates (Xue & Meisels, 2004). Students in this approach are coached to recognize letters and sounds so they can read with fluency and master basic reading skills to understand the text (Xue & Meisels, 2004). The phonics approach takes on a more analytical approach

and is more focused on the student's acquisition of basic literacy skills through sounds and letter recognition (Xue & Meisels, 2004).

As a direct result of the two approaches, there has been a recent push for the integration of both approaches to teach literacy and reading to early childhood students (Xue & Meisels, 2004). The balanced approach to reading method is a hybrid of the whole meaning and phonics approach (Xue & Meisels, 2004). This hybrid approach takes the strengths of the whole meaning and phonics approach to assist young learners link acquiring early literacy skills. Students are taught the meaning of the text as well as essential basic literacy skills to help them to decode the text (Xue & Meisels, 2004). Xue and Meisels (2004) stated the following:

Current research suggests that the most effective path to early literacy is to emphasize the holistic process of reading and writing, as proposed by whole language advocates, but also to ensure that children have a strong grounding in systematic phonics as emphasized by skills proponents (p. 220).

An increasing number of early childhood practitioners are adopting this balanced approach to reading and literacy, and have observed beneficial results (Xue & Meisels, 2004). This integrated approach allows for the young learner to acquire basic literacy skills and to understand the meaning of the story (Xue & Meisels, 2004).

The literacy environment for the young learner is crucial to student success in reading and writing (Morrow, 2012). Research has shown that the home environment for a particular student can influence how the student acquires early literacy skills. Students from low-income communities with a scarce presence of books in the home may have

more difficulty with understanding the function and purpose of a book (Nielsen & Monson, 1996). With knowledge of this deficit, early childhood practitioners have been urged to supplement by creating print-rich literate environments in the classroom (Nielsen & Monson, 1996). Efforts should be made to ensure that the environment provides as many literate opportunities as possible, especially for the low-income student (Nielsen & Monson, 1996). Teachers have been urged to supplement what the individual student is lacking in terms of early literacy skills (Nielsen & Monson, 1996). Again, literacy environments in the classroom are created by posting words on everyday objects, have centers comprising books with related material available for perusal, make available an ample number of books and opportunities to explore storytelling, employ fantasy play that can help encourage storytelling skills, and provide guided activities which allow the young learner to practice listening and reading a story (Nielsen & Monson, 1996). The emphasis on writing and play can have a significant impact on how the young learner acquires essential early literacy skills (Corcoran & Monson, 1996).

Mathematics is an important content area for the early childhood student (Clements, Sarama, & DiBiase, 2004). Acquiring essential mathematics skills in the early years can help prepare the young student for success in subsequent years (Clements et al, 2004). Early childhood students can begin their schooling career with little to no foundation of mathematics, especially for numbers. Thus, it is imperative that the early childhood practitioner is knowledgeable about and adept at delivering instruction for this difficult and abstract concept (Clements et al, 2004).

There are five key elements that govern the basic development of number sense and which are relevant to the math curriculum in early childhood education:

1. Counting-grasping the one to one correspondence principle.
2. Number knowledge-discriminating and coordinating qualities, and making numerical magnitude comparisons.
3. Number transformation-transforming sets through addition and subtraction, calculating in verbal and nonverbal contexts, calculating with and without referents (physical and verbal).
4. Estimation-approximating or estimating set sizes, using reference points.
5. Number patterns-copying, extending or discerning numerical patterns and relationships (McGuire, Kinzie & Berch 2011, p. 215).

These key elements can be used as a guide to help drive instruction and in creating activities to help the young learner to achieve positive outcomes. Number sense is particularly important for the early childhood student because it sets up students for future success and helps them ease in transition from one subject area to the next.

Building these foundational skills can prepare young learners to be able to grasp more difficult mathematical concepts later on (McGuire et al., 2011). The earlier the exposure to these mathematical concepts and properties, the more likely that desired benefits and positive outcomes will be produced (McGuire et al., 2011)..

Proponents of high quality instruction advise that there are recommendations and practices that can help early childhood practitioners to implement high quality mathematics instruction in the classroom (Clements et al., 2004). The first of these recommended practices is enhancing children's natural interest in mathematics and their disposition to use it to make sense of their physical and social worlds (Clements et al.,

2004). Children in early childhood education have a natural tendency and curiosity to compare and observe their environment (Clements et al., 2004). Children at this age understand the concept of less vs more and how much they have of one particular thing. With this concept in mind, the teacher can capitalize on this existing knowledge to explain and maximize the understanding of the concept.

Building on children's prior existing knowledge is recommended to enhance the understanding of mathematical concepts (Clements et al., 2004). Teachers can use various strategies and methods to help the young learner to draw on his or her own experiences in acquiring mathematical concepts and skills. Students learn difficult and abstract concepts with more ease if prior experiences and knowledge are triggered, making the learning experience more meaningful and relevant (Clements et al., 2004). By the same token, teachers must also take into account the individual abilities of each student in terms of cognitive, social-emotional, linguistic, and physical skills (Clements et al., 2004). Lessons and activities should be designed and implemented in a way that is developmentally appropriate for the individual young learner.

Teachers can use skills, such as problem solving and reasoning, to integrate mathematics into other content areas. Early childhood students who can acquire and master these more difficult skills in mathematics will be able to transition into other areas which require the same skills to solve a problem or use reasoning to arrive at a solution (Clements et al., 2004). Thus, high quality instruction in mathematics can help the young learner to become successful throughout his or her academic career (Clements et al., 2004).

Within recent years, early childhood education has witnessed a growing trend in public schools and especially in early childhood classrooms, involving differentiated instruction. Differentiated instruction has spurred early childhood advocates to truly deliver instruction that is individualized for optimal learning and academic success (Heacox, 2012). Differentiated instruction in the early childhood classroom helps to maximize learning opportunities and creates environments in which the young learner can thrive. This approach shares similar characteristics with the developmentally appropriate practices well-known in the early childhood education community (Kostelnik & Grady, 2009). Differentiated instruction takes into account the individual learner's abilities, skills, and learning preferences. Teachers can use this knowledge to properly assess, design, and implement curricula that are tailored to the young learner's needs (Kostelnik & Grady, 2009).

Teachers can use the four following classroom elements to differentiate instruction: content, process, product, and learning environment (Heacox, 2012). The content of a classroom to differentiate instruction could utilize varying levels of materials to adapt to the young learners' abilities (Heacox, 2012). Early childhood practitioners have been adept at using work stations to allow students to work on projects and activities which correspond with their individual learning abilities and preferences (Heacox, 2012). An early childhood classroom can have as many as five work stations at one time. Rules and procedures are established early on in the year to demonstrate to and guide students toward using the work stations appropriately and to their advantage. Work stations consist of varying activities and academic levels to accommodate each of the students (Heacox, 2012). Students transition from one work station to the next in small

groups or in pairs. Teachers may also strategize and pair or group various students together to allow stronger students to scaffold and mentor other students who may have difficulty with certain learning concepts and material (Heacox, 2012).

A few examples that teachers could use to differentiate instruction through processes include using tiered approaches for various activities and projects as well as varying the length of time for completion of assignments (Christensen, 2009). Teachers can employ a tiered approach for different work station areas in the early childhood classroom by providing varying levels of how a student can begin the activity or project (Christensen, 2009). This method allows for each student to assess his or her own learning and to truly have control in the learning process. Varying the length of time for completion also allows for students to complete activities and class assignments according to their own pace and learning abilities (Christensen, 2009). Again, this process provides for optimal learning in an early childhood classroom, especially with breadth and depth of the various learning styles and levels (Christensen, 2009).

One of the ways in which teachers can effectively implement differentiated instruction, in terms of the products of the learning process, is allowing for multiple and alternate ways to express achievement of the learning objective/concept (Christensen, 2009). For example, in a given workstation that instructs the students to learn a reading objective, students can present their understanding of the objective in different ways (Christensen, 2009). This can be expressed in a writing, creating a puppet story, or drawing from what the young learner has achieved via the workstation. Allowing for young learners to explore multiple ways to express themselves and to adapt the learning

objectives to their individual learning styles and preferences can result in beneficial outcomes and further enhance learning (Heacox, 2012).

The learning environment must also be designed in a way that will reach all learners and make the materials accessible to each individual learner's needs. Examples of differentiating the classroom environment can include using different levels of books in the library center (Heacox, 2012). Various shapes, colors, audio recordings, and textures of books can be included to attract the attention of each individual learner whether or not he or she may have a visual, auditory, or kinesthetic learning style (Heacox, 2012). Varying the materials in the classroom allows for the young learner to have more autonomy and control over his or her own learning and helps to encourage creativity and independence (Heacox, 2012).

Small group instruction is also an essential element of the differentiated instruction classroom. The teacher may begin instruction by addressing all of the students in a whole group setting. The whole group lesson may include the basic introduction of the concept or material and some explanation as to what will be learned regarding the lesson topic. Students then proceed in the workstations while the teacher may call a small group of students to work with her to help scaffold some difficult concepts. This small group instruction practice allows for the teacher to work more intimately with her students and to assess the varying levels understanding the material in her classroom. Small group instruction provides the teacher with the time to modify and re-teach difficult concepts to students that may be struggling with a particular learning objective (Heacox, 2012).

Differentiated instruction has become the forefront and cornerstone of educational practice (Heacox, 2012). Early childhood practitioners use differentiated instruction to better accommodate the varying levels of their students (Heacox, 2012). This approach takes into account the individual learner's needs and abilities, and allows for the teacher to modify and individualize instruction based on the individual (Heacox, 2012). In a given classroom, one student may learn differently from another student (Heacox, 2012). Differentiated instruction considers these differences and capitalizes on them to ensure that each student will learn at their maximum potential and abilities (Heacox, 2012).

Early Childhood Center vs. Traditional School Settings

The third part of this literature review will involve analyzing a direct comparison of early childhood education and upper elementary grades. Specific methodologies will be discussed, such as developmentally appropriate practices and standards-based accountability. Students in early childhood education will also require much more emotional and social support as they develop and transition to the upper elementary grades. A discussion of the social-emotional relationships as well as their importance and implementation will also be used to highlight the different needs of early childhood education students and upper elementary grade students. Finally, this section will conclude with a brief discussion on the inclusion of early childhood education programs in traditional elementary schools and the ramifications which arise from such an inclusion.

One of the beacons of early childhood education is the developmentally appropriate practice. This approach to instruction for early childhood learners is exactly as the name itself suggests; it is a way of teaching that corresponds to the individual

learner's abilities and needs (Kostelnik & Grady, 2009). Instruction and learning is centered around the learner, and the teacher serves more in a facilitative role rather than directly guiding and controlling the learning process (Kostelnik & Grady, 2009).

There are three interrelated principles of the developmentally appropriate practice for teachers (Kostelnik & Grady, 2009):

1. What they know about how children develop and learn.
2. What they know about the strengths, needs and interests of individual children.
3. What they know about the social and cultural contexts in which children live (p. 72).

Age is a critical factor in the developmentally appropriate practice because it informs the teacher on how to tailor the instruction for the young learner (Parette, Queensberry, & Blum, 2010). Knowing and understanding the cognitive development of the young learner at various stages in his or her life helps the teacher to design and create lessons that are most appropriate and relevant for early childhood students (Parette et al, 2010). For example, a kindergarten classroom will look differently than a first grade classroom. Early childhood students develop at a rapid pace and one year in age difference can dictate how an early childhood teacher should deliver instruction (Kostelnik & Grady, 2009). Children perceive and experience information differently during each stage in their lives. Understanding the age development of early childhood students can help to maximize instruction and optimize learning (Kostelnik & Grady, 2009).

It is important that the early childhood teacher takes notice of the age and development of early childhood students (Kostelnik & Grady, 2009). Discerning and distinguishing how a certain age group can properly perform and complete certain tasks and activities will help the early childhood practitioner create and implement instructional material which is meaningful and relevant to students. Developmentally appropriate practices are also individually appropriate (Kostelnik & Grady, 2009). This characteristic of developmentally appropriate practices is shared with the same theory and approach as differentiated instruction (Kostelnik & Grady, 2009). Like differentiated instruction, developmentally appropriate practice focuses on the individual learner and takes his or her other strengths and weaknesses into account to tailor instruction that truly meets the needs of the individual learner (Kostelnik & Grady, 2009). Again, individualized instruction is designed and used to make the instructional material relevant and meaningful for the young learner. The teacher constantly gauges progress in the classroom and assesses students on a regular basis in order to truly differentiate instruction through modification and tailoring:

She observes the children carefully and makes specific plans and modifications to accommodate children's varying degrees of interest and understanding. In carrying out these plans, the teacher takes into account what the students are ready for and what they need to learn. She chooses tasks that are challenging but achievable, and she organizes the classroom so each student has a chance to understand and apply new information and skills. Finally, she monitors the children's progress to gain insights into

what the children are learning, how they are learning, and what reasonable next steps might be (Kostelnik & Grady, 2009, p.75).

The third fundamental principle of the developmentally appropriate practice is the social and cultural context of early childhood students (Kostelnik & Grady). In recent years, it has become significantly important that early childhood practitioners have some understanding of the diverse cultures which may be present in the early childhood classroom (Kostelnik & Grady). Early childhood students enter the classroom with their own set of beliefs, preconceived notions, and ways of perceiving the world around them. The learning process is made much easier when the early childhood practitioner takes into consideration the diverse cultures in her classroom and designs instructional material that accommodates this diversity:

Educators committed to developmentally appropriate practice work hard to learn about the cultural beliefs that children bring from home. They understand that the more congruent expectations are between family and school, the more productively children learn. When they are unsure about culture, they make an effort to find out. As they seek to understand and apply what might be meaningful to and respectful of children and their families, educators are acting in accordance with the principle of social and cultural appropriateness (Kostelnik & Grady, 2009, p. 77).

There are typically twelve practices that are associated with developmentally appropriate practice: (a) adults build warm, caring relationships with children; (b) child guidance is directed toward helping children achieve self-regulation; (c) curricula are comprehensive; (d) curricula address the learning needs of all children; (e) curricula are

integrated; (f) children have many opportunities to learn through firsthand experiences; (g) children initiate many activities and make choices about how they will learn; (h) classroom environments are safe and stimulating and routines are well-suited to the needs of young children; (i) teachers assume a variety of roles and use a wide array of strategies to support children's development and learning; (j) children have many opportunities to learn through play; (k) assessment is continuous, multidimensional, and observation based; and (l) education involves reciprocal relationships with families (Kostelnik & Grady, 2009). These twelve practices capture the true essence of developmentally appropriate practice (Kostelnik & Grady). There is a strong emphasis on gearing the classroom towards a more child/learner-centered environment as opposed to a heavy emphasis on teacher instruction and direction. In this paradigm, the young learner is in control of his or her own learning process and works with the teacher on difficult tasks and concepts to guide and scaffold the learning (Kostelnik & Grady). The curricula and learning environment are designed with the individual needs of each student in mind. The teacher constantly tailors and fine tunes her lessons and activities to meet the individual needs of all of her students.

In contrast to the developmentally appropriate practice for early childhood classrooms, there has been an increasing interest in using the standards-based accountability approach for early childhood students (Graue, 2008). The standards-based accountability approach revolves around the notion that students must be taught according to state standards and curricula (Anderson, 2009). The emphasis for this approach can be traced back to the legislation of the No Child Left Behind Act (2001). The No Child Left Behind Act transformed the field of education and demanded

standards and accountability for students and teachers in public education (Graue, 2008). Funding for schools was allocated according to the performance and completion of such standards and accountability (Stipek, 2006).

Standardizing and establishing systems of accountability in the field of education has had its advantages and disadvantages (Kgan & Scott-Little, 2004). As an advantage, instructional staff and administrators are held accountable for the performance of their students (Alexander, 1988). Actual systems of accountability have emerged, allowing teachers and administrators to track their students' progress through comprehensive data collection and evaluation systems (Graue, 2008). Tracking and collecting data has helped instructional staff and administrators to effectively impact their students and modify instruction when necessary (Stipek, 2006). One of the disadvantages of standardization and accountability systems has been the quality and content of instruction. Schools have felt the pressure and risk of losing allocated funds for their operating budget and, consequently, have taken drastic measures to ensure that such funding is not lost (Stipek, 2006). Instructional staff and administrators began to teach material according to the standards while eschewing the basic tenets of the developmentally appropriate practice. Whole group instruction became the norm and the individual learning needs of the student were ignored (Stipek, 2006). Performance goals began to dominate the learning goals of the individual student, which produced negative academic consequences in the long run (Hatch, 2002).

The discordant features of the standards based accountability approach can produce a negative impact on the early childhood classroom. Within the field of early childhood education, advocates have long espoused the significance of developmentally

appropriate practices, especially for the young learner in the early childhood classroom (Hatch, 2002). The integration of the standards-based accountability approach and developmentally appropriate practice can be successful if the latter is implemented in its true form (Hatch, 2002). When the standards-based accountability approach dominates the learning environment, the early childhood student will also experience negative learning outcomes as a result (Stipek, 2009). Advocates have recommended that the standards-based accountability approach should take into account the basic tenets of the developmentally appropriate practice to prevent a deterioration of the education system for early childhood students (Goldstein, 2007).

One study of a school district in Texas was able to reconcile the discordant features of the two approaches and highlighted the ways in which the two approaches can co-exist peacefully in the classroom (Goldstein, 2007). In this study, it showed there are crucial factors which can contribute to the success of integrating the two approaches. One such factor discussed was the preparation and experience of the early childhood teacher (Goldstein, 2007). The more professional support and resources the teacher has in implementing the two approaches in the classroom, the more likely the teacher will be successful in maintaining the basic tenets of the developmentally appropriate practice and adhere to standards-based and accountability systems (Goldstein, 2007).

The experience of the early childhood teacher also plays an invaluable role on the success of the integration of the two approaches. Teachers with more experience and knowledge of the developmentally appropriate practice approach will likely have an easier time blending the two approaches (Goldstein, 2007). Teachers in the early childhood classroom can be adept at designing activities and projects which respond to

the individual learning needs of the early childhood student while simultaneously adhering to standards proscribed by the school district and federal government (Goldstein, 2007). Proper professional development and support are vital to the success of integrating the two approaches. Administrators and local district personnel can contribute to this need by actively seeking and creating professional development opportunities that can better equip teachers (National Governors Association, 2010).

As discussed previously, developing and fostering social-emotional relationships in the early childhood classroom is important to the cognitive development and overall academic success for the young learner (Hamre & Pianta, 2005). The quality of student feedback, interaction between the teacher and student, and how the teacher responds to student behavior can impact the cognitive development of the young learner (Hamre & Pianta, 2005). Developing nurturing relationships can curb the risk of school failure as well as provide positive motivation and stimulation for the early childhood student to achieve academic success (Hamre & Pianta, 2005).

Negative relationships can have an adverse impact on the early childhood student. Teachers displaying negative behavior, such as being non-responsive to students' inquiries and needs can impact the individual student and subject them to at-risk behavior (Hamre & Pianta, 2005). Early childhood students require constant feedback and positive scaffolding to help them through difficult learning concepts (Hamre & Pianta, 2005). Teachers can facilitate positive emotional and social relationships in this manner by being responsive to students' needs and responding in a nurturing manner (Hamre & Pianta, 2005). Positive teacher behavior helps students to become engaged and develop the necessary self-esteem required to assertively navigate through their own learning.

Research has shown that the development and fostering of social-emotional relationships can be highly beneficial for early childhood students of low-income communities (Hamre & Pianta, 2005). Students from low-income communities are at a greater risk for delinquent and ant-social behavior (Yoshikawa, 1995). Certain parenting behaviors and social tendencies such as yelling, corporal punishment, and inattentiveness to young children are more prevalent in low-income communities due to the lack and scarcity of financial resources to cope with an impoverished lifestyle. These findings are important for the early childhood practitioner to take into consideration—the social and cultural background of the student—especially when designing and creating curricula for the student (Yoshikawa, 1995). Early childhood practitioners are more successful in helping students from low-income communities when they are more responsive and sensitive to the students' social and emotional needs (Campbell, 1994). Extensive research has documented and investigated the effect of integrating early childhood education programs in traditional elementary schools (Desimone et al., 2004)

It is evident from the prior sections of this literature review that it has been sufficiently established that early childhood education is a distinct and independent field of education. Early childhood education has been rooted in the cognitive, social-emotional, and physical development of the early childhood student (Campbell, 1994). Early childhood students perceive their environment in their own ways, learn about difficult concepts differently as opposed to their upper grade level counterparts, but all usually require adequate amounts of social-emotional support to guide them throughout the learning process (Desimone et al., 2004). Developmentally appropriate practices help

to provide some type of structured framework and guidance for the early childhood teacher to sufficiently respond to the needs of the individual early childhood student.

Traditionally, schools across the country have included early childhood programs and grade levels with upper elementary grades. Until recently, more urban cities are following a trend of establishing independent early childhood centers due to problems of limited space and overcrowding (Desimone et al., 2004). This growing trend towards the development of independent early childhood centers has impacted the way practitioners previously viewed early childhood education (Desimone et al., 2004). There are advantages and disadvantages for this new scheme.

The inclusion of early childhood grades, such as prekindergarten, kindergarten, and first grade classes in the traditional elementary school, has presented some challenges and concerns. The first of these concerns is the amount of available support for early childhood teachers (Desimone et al., 2004). One of the problems with the inclusion of the early childhood grades into a traditional elementary school is the constant positioning for resources and support (Desimone et al., 2004). Early childhood teachers in these settings have expressed their sentiment and concern that campus administrators tend to focus on the upper elementary grades much more than on the early childhood grades (Desimone et al., 2004). The standards-based accountability approach has impacted all grade levels in the traditional elementary school setting (Desimone et al., 2004). Basically, the better the upper elementary grade levels perform on the standardized tests, the better the chances to increase funding or sustain it at operational levels (Desimone et al., 2004). For this reason, campus administrators traditionally have the tendency to invest more time and resources into the upper elementary grades because student performance in these grade

levels are critical in determining funding for the campus (Desimone et al., 2004). As a result of this process, early childhood classes are kept either at the fringes of the schools or are obligated to teach subjects and content area which are not developmentally appropriate for early childhood students (Desimone et al., 2004).

There has been an increasing push-down of certain subjects and content areas to the early childhood grade levels (Hatch, 2005). For example, first grade students may be taught concepts and skills which would be reserved for second grade students (Hatch, 2005). This constant battle with adhering to the standards and implementing developmentally appropriate practices can create negative consequences for the early childhood student (Hatch, 2005). The strain on resources and professional development opportunities further marginalizes the early childhood grade levels (Desimone et al., 2004). This marginalization has created feelings of neglect; which has adversely impacted early childhood achievement (Desimone et al., 2004). Campuses which are focused on meeting the standards and performing well on standardized tests and accountability instruments have a tendency to provide professional development opportunities designed for the upper elementary grades (Desimone et al., 2004). The support of the administration is necessary in order for early childhood practitioners to fully implement and deliver high quality instruction to early childhood students (Hatch, 2005).

With concentrated efforts and commitment for the upper elementary grade levels, a climate of condescension and disrespect can arise (Desimone et al., 2004). Early childhood teachers have experienced ill treatment and misunderstanding of their grade levels; especially the early childhood students. Upper elementary grade teachers may

view the developmentally appropriate practice approach as mere child's play without fully understanding the cognitive, social-emotional, and physical development needs of the very young learner (Brown, 2009). This misunderstanding can inhibit the way an early childhood practitioner is viewed on campus and as well as his or her value (Desimone et al., 2004). Upper elementary teachers and administrators with no knowledge or experience of early childhood education can hinder the progress of the early childhood practitioner (Wise & Wright, 2012).

One of the advantages of the inclusion of early childhood grades in a traditional elementary setting is the collaboration that can result among teachers and staff (Wise & Wright, 2012). Collaboration among early childhood teachers and upper elementary grade teachers can help to foster a more understanding and nurturing environment for all students (Wise & Wright, 2012). Collaborative meetings can foster opportunities teachers to work in a more cohesive manner for the overall benefit of the students (Wise & Wright, 2012). Vertical and horizontal grade level meetings can effectuate the mutual understanding of developmental and academic goals as well as enhance academic achievement for all students (Desimone et al., 2004).

Vertical grade level meetings provide teachers from various grade levels to discuss the academic goals and objectives for each of their grade levels as well as to devise a way in which teachers in each grade level can assist one another (Wise & Wright, 2012). For instance, a learning concept or skill can be introduced in a lower grade level and, with mutual collaboration, the next grade level teacher can help scaffold and provide further reinforcement for the student (Wise & Wright, 2012). The advantage of having teachers meet and discuss the intended learning objectives and goals for the students is it

can help to create a learning environment which is highly beneficial and productive (Wise &Wright, 2012).

One of the disadvantages which can arise from the inclusion of early childhood grades in a traditional elementary school setting is the limitation of physical space and resources (Wise &Wright, 2012). Early childhood practitioners oftentimes find they are constantly competing for physical space within the building. For example, there may be designated outside play areas for early childhood students. However, with overcrowding and a strain on space, upper elementary grades are compelled to utilize these same outside play areas. Of course, this presents a safety issue wherein the younger early childhood students may collide with upper elementary grade students (Wise &Wright, 2012). Some research findings have shown that early childhood teachers may compete with upper elementary grade teachers for physical items, such as refrigerators and photocopiers (Desimone et al, 2004). Further, the layout and accommodations of a traditional elementary school might not respond appropriately to the physical and developmental needs of the early childhood student (Desimone et al, 2004). For example, bathroom facilities are not equipped to address the needs of the early childhood student, such as the height of the toilet or the sink (Desimone et al, 2004) .

Early childhood grade levels and upper elementary grades might be able to coexist peacefully in a traditional school setting if certain recommendations and suggestions are implemented. One recommendation from the research involves providing adequate training for all teachers and administrators to fully understand the concepts and theories of early childhood education (Desimone et al., 2004). Professional development opportunities used to educate and enhance the understanding of the work of early

childhood professionals may help non-early childhood professional work in a more collaborative fashion (Desimone et al, 2004). These professional development opportunities may also help to reconcile any confusion or dispel myths and non-truths about early childhood education. Upper elementary grade level teachers can benefit from this knowledge because it has been shown there is significant importance to equipping young learners with the necessary skills to establish a solid academic foundation (Desimone et al, 2004). Upper elementary grade level teachers can use this understanding to build upon these foundational skills to maximize the learning potential of their students (Desimone et al, 2004) . Early childhood students must transition to upper elementary grade levels (Desimone et al, 2004) . The reinforcement and scaffolding of these foundational skills, rooted in early childhood education, can greatly benefit upper elementary grade level teachers to make the learning process easier (Desimone et al, 2004).

CHAPTER THREE

METHODOLOGY

Introduction

This chapter includes a discussion of the methodology that was used to complete the research of this study. This study employed a quantitative non-experimental design, using a causal-comparative analysis, to compare two different groups. As stated in chapter one, the purpose of this research was to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. Data in this study were from the years 2012-2013 and 2013-2014 for bilingual and monolingual prekindergarten students who attended traditional comprehensive elementary schools and those who attended independent early childhood centers (ECC).

Monolingual prekindergarten students in independent early childhood centers were compared against monolingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Bilingual prekindergarten students in independent early childhood centers were compared against bilingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Additionally, a cross comparison was made between bilingual prekindergarten students in early childhood centers and monolingual prekindergarten students in traditional comprehensive school settings in the area of math. Finally,

monolingual prekindergarten students in early childhood centers were compared against bilingual prekindergarten students in early childhood centers in the area of math.

The traditional school and early childhood center settings served as the independent variables in this study. The dependent variables in this study were the academic performances of the groups of students at each of the respective settings. Again, the overarching question in this study was to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments.

The data used to determine whether significant differences existed between the academic setting and the academic performance of these prekindergarten students were primarily gleaned from the Frog Street literacy and mathematics assessment data collected over the course of two consecutive years, 2012-2013 and 2013-2014. Specifically, data used in this study were the mastery scores of individual students from the four early childhood centers and four traditional elementary schools. Frog Street Assessment data consisted of mastery scores of individual students which were represented as percentages.

The discussion also includes a description of the participants, specific demographics of each population, instruments that were used to analyze the data, and a description of the school used to compare the differences between each school setting. In addition, there is a brief overview of the procedures and methods that were used to glean the data from district assessment tools via their results and outcomes. Finally, the limitations of the research are also included in this chapter.

Research Design

A quantitative, non-experimental, causal-comparative design, using inferential statistics, was implemented in order to draw differences and comparisons from the data (McMillan & Schumacher, 2014). For the purposes of this study, the null hypothesis stated that no significant difference exists between the independent variables, especially in terms of academic achievement for prekindergarten students. The causal-comparative design is appropriate due to the non-random assignment of the four groups and the purpose of finding whether significant differences exist in terms of literacy and math academic achievement for students in each of the settings (McMillan & Schumacher, 2014). Specifically, data used in this study were the mastery scores of individual students from the four early childhood centers and four traditional elementary schools. Frog Street Assessment data consisted of mastery scores of individual students which were represented as percentages. For example, if a particular student mastered seventy-five percent (75%) of the concepts, skills, and objectives assessed by Frog Street, then the student's score would be represented as seventy-five percent (75%). These mastery scores were subsequently used to calculate the average mastery score for each classroom used in the population sample. After average mastery scores were calculated for each classroom they were then used for the independent samples t-tests to obtain the proper formulations and calculations.

Data extracted from the Frog Street assessment for the two-year period were compared utilizing an independent samples t-test to determine whether a significant difference exists in terms of academic literacy or math achievement between prekindergarten students at the traditional school setting and prekindergarten students at

the early childhood centers. The means for each of the two groups were calculated and compared to determine the level of significance.

The t-test formula was used to generate a number that was then used to determine the probability level of rejecting the null hypothesis (McMillan & Schumacher, 2014). For the purposes of this study, the null hypothesis stated that no significant difference existed between the independent variables, especially in terms of academic achievement for prekindergarten students. The sample means, standard deviations, and sizes of the samples were used to determine the t-value (McMillan & Schumacher, 2014). A causal-comparative analysis was utilized to compare the significant differences of academic performance between monolingual students in an early childhood center and monolingual prekindergarten students at a traditional school setting. Similarly, a comparison was made to determine whether a significant difference exists for bilingual prekindergarten students in an early childhood center and those at a traditional school setting. A cross comparison was also made between prekindergarten students enrolled in bilingual classes and monolingual prekindergarten students. The causal-comparative design is appropriate due to the fact that these conditions and variables have already occurred (McMillan & Schumacher, 2014).

The dataset consisted of data collected over the course of a two-year period which has past. The data included results from the district's Frog Street literacy and mathematics assessments from four early childhood centers and four traditional elementary schools. The means for the two groups and the standard deviations were calculated to determine the t-value. The participant data were collected from the district's research department and evaluated to reach research conclusions. The procedures used in

requesting the data adhered to district and academic university guidelines. A proposal was sent to the district's research department outlining the scope, purpose, and design of the research study. A request of the specific data used in the study was presented to both the district and the university. Proposals were reviewed by the appropriate personnel in each of the entities to ensure that the request conformed to district and university standards.

The data were treated with confidentiality and handled properly to ensure all district and university regulations/procedures are adhered to accordingly. Data collected and gathered from the district's research department was protected and used for the purposes of the study. A consent/request for data was prepared and submitted to obtain the Frog Street Assessment. After approval from the district's research department was obtained, the requested data was sent by the early childhood department director via email containing the Frog Street Assessment data. Similarly, university standards were also adhered to and administered accordingly. An application to the Institute Review Board (IRB) was created and submitted detailing the specific data to be used and the procedures to be observed in the treatment of this data.

Research Questions

The research used the following questions to guide its work:

1. Is there a significant difference between monolingual (English speaking only) prekindergarten students' academic literacy achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

2. Is there a significant difference between monolingual (English-speaking only) prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?
3. Is there a significant difference in academic literacy achievement between prekindergarten students enrolled in bilingual classes as measured by the Frog Street Assessment compared to those prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
4. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
5. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early childhood center at the end of the school year?
6. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual

prekindergarten students enrolled in a traditional elementary school at the end of the school year?

Setting

The data sample was taken from ABC Independent School District, particularly from four early childhood through fifth grade schools and four early childhood centers. At the outset of the study, ABC ISD was the seventh largest school district in the nation and the largest school district within the state of Texas (ABCISD, 2014). Further, ABC ISD served an area in the Harris County area; covering more than 301 square miles (ABCISD, 2014). Also at the time of the study, ABC ISD was comprised of 283 schools, serving approximately 203,354 students (ABCISD, 2014). ABC ISD had a graduation rate of 78.5% and a dropout rate of 11.8% (ABCISD, 2014). Approximately 62.7% of the student population were Hispanic, 24.6% were African American, and 3.4% Asian (ABCISD, 2014). In addition, there were 160 elementary schools and seven early childhood centers across the district (ABCISD, 2014).

Data samples were taken from schools in the same area of the city—the metropolitan part of town. Campuses were selected based on their proximity to one another. For example, the early childhood centers were located within a two (2) mile radius from the traditional schools. At the time of the study, students in this area of town were predominantly Hispanic and 100% of the population was considered as low socioeconomic status (ABCISD, 2014). In addition, more than half of the students were considered at-risk and were enrolled in a bilingual program (ABCISD, 2014).

In terms of the individual classroom settings for each of the campuses included in the population sample, every effort was made to ensure that classrooms that possessed

high quality characteristics were included in the population sample. The school district has every intention to ensure that each student receives a high quality education and instruction. Although the intent and expectations are clear, there are factors that can impact the quality of a classroom such as the instructional experience of the teacher, district enrollment caps, availability of instructional leadership support, adequate resources and materials, and the school's emphasis on developing parent/community involvement.

Typically in the parlance of early childhood education, certain characteristics have been identified as those of a high quality classroom such as low student-teacher ratio, adequate time for teachers to reflect and practice new methods and instructional strategies, learner-centered environments, differentiated instruction, and strong relational ties between the school and home to help solidify academic success (Brooks-Gunn, 2000; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995).

Additional research in this area has also noted other characteristics: explorations, guided discovery activities, problem solving activities, discussions, demonstrations, and direct instruction (Kostelnik & Grady, 2009). Exploration provokes the curious and the inquisitive nature of early childhood learners. Exploration activities also provide students with the opportunity to arrive at multiple conclusions instead of been restricted to one (Kostelnik and Grady, 2009).

Guided discovery activities utilize the scaffolding technique wherein the teacher serves more as a facilitator (Kostelnik and Grady, 2009). Students still retain much of their independence during these activities, but also require some assistance from the teacher to be guided through the learning process (Kostelnik and Grady, 2009). Teacher

behaviors include modeling how to find answers, provide information and tools, offer opportunities for practice, and challenge children's thinking (Kostelnik & Grady, 2009).

Problem solving activities are an elevated form of guided discovery (Kostelnik & Grady, 2009). In addition, students are encouraged to use their investigative and inquisitive skills to actively work on problems (Kostelnik and Grady, 2009). Some student behaviors for this activity include hypothesizing about why something happens, gathering information, making predictions, constructing explanations, brainstorming, generating solutions, evaluating results and plans, making plans for new experiments or approaches, and communicating results (Kostelnik & Grady, 2009). Discussions provide opportunities for young learners to engage and interact in joint conversations with the teacher (Kostelnik and Grady, 2009). The teacher guides the discussion and plans it thoughtfully and purposefully so the students can participate in the discussion with the intent of identifying some goals to be achieved. Discussions are an important aspect of the early childhood classroom because it allows for the young learner to develop social, mechanical, and grammatical rules of conversing and discussing topics (Kostelnik & Grady, 2009).

Demonstrations help the teacher to model instructions or illustrate how an activity can be completed (Kostelnik and Grady, 2009). Teachers use demonstrations to explain difficult concepts and to model how the activity can be completed (Kostelnik and Grady, 2009). Teachers and other students who model behavior also use demonstrations as a guiding and scaffolding tool which can provide a preview of something to occur later (Kostelnik & Grady, 2009).

Direct instruction lends the teacher more autonomy and control over what material and concepts will be covered (Kostelnik and Grady, 2009). Teachers use direct instruction to help students through difficult material and guide them to a single correct response (Kostelnik & Grady, 2009). Children have less control when direct instruction is implemented (Kostelnik and Grady, 2009). This does not necessarily mean that direct instruction should never be used, but, instead, suggests that direct instruction should be used sparingly with regard to the other ways in which learning concepts can be taught to the early childhood learner (Kostelnik and Grady, 2009).

The aforementioned characteristics of a high quality early childhood classroom were uncontrolled variables in this study. Early childhood classrooms in the school district are expected to maintain quality instruction for students but sufficient data could not be obtained to adequately screen all classrooms for these characteristics. Despite the lack of sufficient data, certain school district initiatives and professional development opportunities were implemented to assist in controlling for these uncontrolled variables.

Teachers in the school district that administered Frog Street assessments and implemented the Frog Street curriculum were provided with professional development/training opportunities to help prepare them in properly delivering high quality instruction attuned to early childhood students' needs. These professional development training opportunities were offered each summer for the two years that were involved in this study, 2012-2013 and 2013-2014. Five full training days were offered throughout the course of the academic year, with the first full day of training scheduled in the summer before the start of the academic year (Frog Street Press, 2014).

This first full day of training in the summer was an overview training that provided teachers with the foundation, tools, and resources to equip them in incorporating high quality characteristics of an early childhood classroom with the Frog Street curriculum and assessments (Frog Street Press, 2014). The four remaining full day trainings were offered to teachers that needed additional support and assistance in implementing the Frog Street curriculum and administering the assessments in their intended manner. The high quality characteristics that were reiterated and emphasized throughout the Frog Street trainings were: explorations, guided discovery activities, problem solving activities, discussion, demonstrations, direct instruction, learner-centered environments, and differentiated instruction (Frog Street Press, 2014).

In regards to maintaining low-student ratios in each of the classrooms, the school district utilizes an enrollment cap of twenty two students per classroom thus making the teacher-student ratio of 1:22. Classrooms in this study had at least 22 students in each of the classrooms as a result of this cap. Federal mandates such as Title I also require that each campus adhere to parent-school compacts which specifically describe the manner in which each campus will maintain strong relational ties between families and schools in the school district (Elementary and Secondary Education Act of 1965, Title I, Part A). Schools in this study adhered to such requirements due to their Title I statuses.

Professional learning communities are also implemented within each campus in the school district to provide opportunities for professional growth in allowing teachers adequate time to reflect and practice new methods and instructional strategies. All classrooms involved in this study had teachers that participated in these professional learning communities as an expectation of the school district.

Subjects

Participants in the study were human subjects, namely students. The current study included 1,100 prekindergarten students in bilingual classes and monolingual students from four independent early childhood centers and four traditional school-based early childhood programs in a large urban school district in Texas. Specifically, there were 484 monolingual pre-kindergarten students and 616 pre-k students enrolled in bilingual classes. Students in this study were enrolled in prekindergarten programs either at independent early childhood centers or traditional school-based prekindergarten programs. Students needed to be four years-old on or before September 1 of the school year and live within each school district's attendance boundaries. Additionally, students in this study had to have met at least one of the following criteria:

- Be homeless
- Be unable to speak or understand English
- Be economically disadvantaged
- Be the child of an active-duty member of the United States military or one who has been killed, injured, or missing in action while on active duty
- Is or ever has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201 of the Texas Family Code
- Meet any eligibility criteria for Head Start, not only those who meet the low-income eligibility criteria for Head Start.

The independent early childhood centers and traditional school-based early childhood programs were selected based on their close proximity to one another, located

within a two (2)-mile radius of each other. This selection process was intentionally done to ensure that homogeneity between the sample population groups would be as similar as possible. The similarity in neighborhood factors and demographics between the two groups were also observed to ensure minimal amounts of bias for the two independent groups.

Table 1 below provides a summary of the demographic percentage averages for each of the independent early childhood centers during the 2012-2013 and 2013-2014 academic years. The numbers represent the percentages of the entire student population for each of the early childhood centers in the respective demographic categories.

TABLE .1 *Demographic percentages for Early Childhood Centers*

ECC	Bilingual Program	Title I	Economic Disadvantaged	At Risk
ECC 1	71	100	89	99
ECC 2	61	100	98	100
ECC 3	57	100	97	99
ECC 4	26	100	100	100

Table 2 below provides a summary of the demographic percentages for each of the traditional school-based early childhood programs during the 2012-2013 and 2013-2014 academic years. The numbers represent the percentages of the entire student population for each of the traditional schools in the respective demographic categories.

TABLE 2. *Demographic percentages for Traditional School Based Early Childhood programs.*

Traditional School	Bilingual Program	Title I	Economic Disadvantaged	At Risk
School 1	71	100	100	90
School 2	66	100	97	86
School 3	58	100	97	83
School 4	37	100	97	74

Although data from human subjects were collected and ascertained for the purposes of this study, in adherence to university protocol and procedures, secondary and de-identified data were utilized, thereby waiving the requirement to obtain informed consent from individual human subjects. Data from student participants were from two years prior to the commencement of this research study.

Other groups that were excluded from the study included special education populations/students, students from the PALS (Preschoolers Achieving Learning Skills) program, or classrooms which consisted of teaching assistants. Selection for each of the groups took into account the intention to create homogenous groups for accurate comparisons. As a result of this limitation, generalizations beyond the bilingual and monolingual classrooms cannot be applied for these special groups that possess these characteristics.

Procedures

The following considerations were included for gathering the data and using it for research purposes:

1. A request was made and granted by the research and accountability department of ABC ISD to obtain approval for garnering the requested samples of data for prekindergarten students in four early childhood centers and four traditional school settings.
2. The request for data included Frog Street Assessment data in the areas of mathematics and literacy.
3. The data contained only the schools' names, teachers' names, beginning of the year results, and end of the year results.
4. Permission was requested from the IRB in order to proceed with the research.
5. The first sample of data were taken from the early childhood centers. Student data was also taken from the research department and used in the research to demonstrate whether a significant difference exists in terms of academic achievement between prekindergarten students in an early childhood center and those in traditional school settings as measured by the Frog Street literacy and mathematics assessments.
6. There were separate phases of assessing the collected data, utilizing the data in t-test calculations to make the appropriate comparisons and summarizing the findings from the calculations for a final analysis.

The first phase consisted of determining the independent and dependent variables from the data collected and formulating the research problem. The independent variable for the purposes of this research design was the academic setting—an early childhood center or a traditional school setting. The dependent variable for the purposes of this research design was the academic achievement of prekindergarten students as measured by the Frog Street Assessment in the content areas of literacy and mathematics. A causal-comparative design is used in this study to determine whether the academic setting (the independent variable) has any significant effect on the academic achievement of prekindergarten students in the areas of literacy and mathematics (the dependent variable).

The second phase consisted of finding and selecting the groups that were compared. For this research study, prekindergarten monolingual and bilingual students at early childhood centers and traditional school settings have were selected. Groups of students selected were as homogenous as possible. Homogenous selection was utilized to ensure that the data were treated without any biases, and student groups compared against one another coincided as much as possible in order to reduce the threat to internal validity. Groups were chosen according to their community setting, at-risk factors, and language abilities.

The third and final phase consisted of collecting and analyzing the data on the subjects. Since the events have already occurred, data from the appropriate sources only need to be gathered. In other words, the Frog Street data for prekindergarten students in the areas of literacy and mathematics was provided by the school district and used to

make the appropriate calculation using the t-test formula. Interpreting the results from the data gathered used cause and effect statements cautiously.

Instruments

Data from Frog Street literacy and mathematics assessments were used in this research. The Frog Street Assessment is a curriculum based assessment scale (Lara-Alecio, Tong, Irby, 2013). Specifically, data used in this study were the mastery scores of individual students from the four early childhood centers and four traditional elementary schools. Frog Street Assessment data consisted of mastery scores of individual students which were represented as percentages. For example, if a particular student mastered seventy-five percent (75%) of the concepts, skills, and objectives assessed by Frog Street, then the student's score would be represented as seventy-five percent (75%). These mastery scores were subsequently used to calculate the average mastery score for each classroom used in the population sample. Each student received two types of mastery scores; one in literacy and another in math. The mastery literacy score was a conglomerated average of the eight skills assessed in the literacy portion of the Frog Street assessment. Likewise, the mastery math score was a conglomerated average of the eight skills assessed in the math portion of the Frog Street assessment. After average mastery scores were calculated for each classroom they were then used for the independent samples t-tests to obtain the proper formulations and calculations.

A request was submitted to the research department of ABC ISD to release information about the four early childhood centers and four traditional elementary schools for the garnering the Frog Street data. The Frog Street tools for literacy and mathematics are one-on-one assessments which allow the instructor to measure and

gauge prekindergarten students' understanding on a variety of skills and objectives, such as the following: (a) letter knowledge, including upper case and lower case, (b) rhyme and alliteration; (c) vocabulary; (d) letter sounds, writing, and writing name. As for mathematics, students will be assessed on their comprehension of rote counting, numerals recognition, subitize, one-to-one counting, cardinality, and patterns and operations.

In terms of vocabulary, students are tested on the breadth and depth of their vocabulary by identifying pictures. Teachers assess students in this domain by showing a picture to an individual student and asking the student to identify what is in the picture. Students are also assessed on their ability to form sentences and use language to describe events in a picture. Students are prompted to use their language skills by being shown a picture and then asked by the teacher to describe what is occurring in the picture. Students are also tested on their knowledge of letter recognition, their ability to blend syllables and sounds, and their ability to recognize rhymes. In terms of writing, students are tested on their ability to write their names and are informally assessed throughout the year by their writing portfolios. The portfolios can consist of student work samples, such as scribbles on paper, using drawings to convey meanings, or writing letters to tell a story.

The mathematics portion of the Frog Street Assessment tests students' abilities on rote counting and number recognition. Students are also tested on mathematical concepts such as subitizing to recognize the quantity of objects without counting. One-to-one correspondence is also tested to determine the student's ability to count objects. Additionally, students are tested on their understanding of cardinality. Moreover, students

are asked to demonstrate other skills, such as recognizing patterns and using operational skills to compute simple mathematics.

In regards to the reliability of the Frog Street Assessment, it has been found that if it is aligned with the Frog Street Pre-K Curriculum, the assessment itself is a sound curriculum based assessment (Lara-Alecio, 2013). It has also been concluded that the assessment provides overall item reliability based on the results of the assessment of children attending both Pre-K and Head Start programs in both English and Spanish measures and that if aligned with the Frog Street curriculum it would be effective in benchmarking students as they move through the curriculum (Lara-Alecio, 2013).

The Frog Street Assessment tool provides comprehensive data summaries and reports for each class in the form of classroom reports, bar graph analysis, and pie charts. Class reports include beginning of the year and middle of the year assessments and totals. Students can also be grouped accordingly to provide a clearer way of analyzing the data.

Data Analysis

The inferential statistical tests used in this causal-comparative design were the t-tests for independent groups (McMillan & Schumacher, 2014). The t-tests are appropriate for the comparative data analysis for this research design due to the two independent groups that will be compared against each other: monolingual prekindergarten students in early child centers compared to monolingual prekindergarten students in traditional school settings, prekindergarten students in bilingual classes in early child centers compared to prekindergarten students in bilingual classes in traditional school settings, and monolingual prekindergarten students compared to prekindergarten students in bilingual classes (McMillan & Schumacher, 2014). The level of significance, standard of

error, and type of error was determined once the process of analyzing the data begins using the t-test for the independent groups. Additionally, it was further determined whether the null hypothesis was rejected or accepted in order to properly conclude if a significant difference exists between the two independent groups (McMillan & Schumacher, 2014).

Limitations

Some of the limitations which were encountered during the course of this research included the sample of data being used. For example, bilingual and monolingual student body data had different pools due to their disparate population sizes. Bilingual student data included more student subjects in the population in comparison to monolingual student data as evidenced by enrollment rates for the two year period in this study. Data might also be skewed for some of the early childhood centers in the sample where it had classrooms with an additional Head Start instructor. Early childhood centers that had classrooms with Head Start instructors were excluded in order to ensure homogeneity of the data sets. These classrooms generally have one Head Start instructor and additional teaching assistants on a permanent basis which are not present in a regular early childhood classroom.

Other groups that were excluded from the study included special education populations/students, students from the PALS (Preschoolers Achieving Learning Skills) program, or classrooms which consisted of teaching assistants. Selection for each of the groups took into account the intention to create homogenous groups for accurate comparisons. As a result of this limitation, generalizations beyond the bilingual and

monolingual classrooms cannot be applied for these special groups that possess these characteristics.

The data were collected from four early childhood centers and four traditional elementary schools in ABC ISD. This limitation may not provide an accurate depiction of the overall performance of all prekindergarten students in ABC ISD because there are more than 180 elementary schools in the district, thus foreclosing the possibility of generalizing the data. Another limitation is that the district also changed the number of competencies being assessed over the two-year period. Teachers cited the duration of the Frog Street as a problem due to the cumbersome aspect of administering the assessment one on one for each student for measuring twelve competencies. As a result of this concern, the school district subsequently reduced the number of items for assessment purposes from twelve to eight competencies total. For the purposes of this study, the eight exact competencies were analyzed instead of the original twelve to ensure homogeneity between the data sets.

Uncontrolled variables in each of the classrooms were also cited as limitations during the course of this study. At the cornerstone of early childhood education is the concept of the high quality early childhood classroom. While every effort is made to ensure that high quality instruction is implemented in each of the classrooms, varying characteristics can impact the quality of a classroom such as instructional experience of the teacher, district enrollment caps, availability of instructional leadership support, adequate resources and materials, and the school's emphasis on developing parent/community involvement. The critical and common factors that have been identified in high quality early childhood programs which have garnered positive

outcomes have included, but are not limited to, the following: low student-teacher ratio, adequate time for teachers to reflect and practice new methods and instructional strategies, learner-centered environments, differentiated instruction, and strong relational ties between the school and home to help solidify academic success (Brooks-Gunn, 2000; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995).

CHAPTER FOUR

RESULTS OF THE STUDY

Early childhood education has served as the foundational part of academic education since its inception in the early 1800s (Shonkoff & Meisels, 2000). Theorists and academicians in the area of early childhood education have postulated its advantages and benefits for the youngest student population in education. Although much has been theorized and discussed regarding early childhood education's assumed benefits and advantages, scarce research exists to evidence a causal connection between early childhood education and students. As such, this study may potentially contribute to the growing body of research and scientifically-based knowledge in early childhood education.

Restatement of the Problem

The purpose of this study was to determine whether significant differences existed in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments. Numerous research studies have been conducted to demonstrate the effectiveness of early childhood education, but a gap in the knowledge exists as it pertains to the potential effects of creating independent early childhood centers. The following research questions were used during the course of this study:

1. Is there a significant difference between monolingual (English speaking only) prekindergarten students' academic literacy achievement in early childhood centers as measured by the Frog Street Assessment compared to those

monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

2. Is there a significant difference between monolingual (English-speaking only) prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?
3. Is there a significant difference in academic literacy achievement between prekindergarten students enrolled in bilingual classes as measured by the Frog Street Assessment compared to those prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
4. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
5. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early childhood center at the end of the school year?
6. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood

centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

Methods

A quantitative, non-experimental, causal-comparative design, using inferential statistics, was implemented in order to determine whether a significant difference exists in terms of academic achievement between the two independent sample groups. (McMillan & Schumacher, 2014). The causal-comparative design is appropriate due to the non-random assignment of the four groups and the causal relationships to be studied (McMillan & Schumacher, 2014). Data extracted from the Frog Street Assessment for the two-year period were compared utilizing an independent samples t-test to determine whether significant differences existed in terms of academic achievement between prekindergarten students at the traditional school setting and prekindergarten students at the early childhood centers. The means, standard deviation, and the *t*-value for each of the two independent groups were calculated and compared to determine the *p* value and level of significance. The t-test formula was used to generate a number that was used to determine the probability level of rejecting the null hypothesis (McMillan & Schumacher, 2014).

For the purposes of this study, the null hypothesis stated that no significant difference exists between the independent variables, especially in terms of academic achievement for prekindergarten students. In this study, it was investigated whether significant differences existed in the academic achievement of prekindergarten students

in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street literacy and math assessments.

A causal-comparative analysis was utilized to compare the significant differences of academic performance between monolingual students in an early childhood center and monolingual prekindergarten students at a traditional school setting. Similarly, a comparison was made to determine whether a significant difference exists for bilingual prekindergarten students in an early childhood center and those at a traditional school setting. And finally, a cross comparison was conducted for prekindergarten monolingual students and prekindergarten students in bilingual classes at each of the settings. The causal-comparative design is appropriate due to the fact that these conditions and variables have already occurred (McMillan & Schumacher, 2014).

Descriptive statistics were also used during the course of this study to calculate the means for the different independent groups. The means of the independent groups were subsequently used to calculate the standard deviation for each of the independent groups. Subsequently, these calculations were utilized in the inferential statistics part of the analysis to calculate the *p* value.

Data Collection and Analysis

The dataset consisted of data collected over the course of a two-year period: 2012-2013 and 2013-2014. The data included results from the district's Frog Street literacy and mathematics assessments from four independent early childhood centers and four traditional school-based early childhood programs in elementary schools. The participant data was secondary de-identified, archived data collected from the urban school district's research department and analyzed. The procedures used in requesting the

data adhered to district and academic university guidelines. The data contained only the names of teachers, with no identifying student data. Individual campus names and sites were also included in the delivered data, but have been blocked for the confidentiality and security purposes of this study.

Upon receipt of the requested data, the first stage of the analysis consisted of combing the data to ensure that there were no inherent discrepancies or biases such as skewed numbers are disproportionate figures in the population samples. The means for each of the independent groups were then used to calculate the standard deviation and standard means of error.

The inferential statistical tests used in this causal-comparative design were the t-tests for independent groups (McMillan & Schumacher, 2014). The t-tests were appropriate for the comparative data analysis for this research design due to the two independent groups which were compared against each other: monolingual prekindergarten students in early childhood centers compared to monolingual prekindergarten students in traditional school settings; bilingual prekindergarten students in early childhood centers compared to bilingual prekindergarten students in traditional school settings; and a cross comparison was conducted for prekindergarten monolingual students and prekindergarten students in bilingual classes at each of the settings. (McMillan & Schumacher, 2014). The level of significance was set at $p < 0.05$. Using this p value helped to determine whether to reject or accept the null hypothesis and to properly conclude whether significant differences existed between the two independent groups in terms of academic achievement for prekindergarten students (McMillan &

Schumacher, 2014). A 95% confidence interval of the difference was also used to determine the upper and lower limits of the dataset.

Summary of Students in the Study

The current study included 1,100 prekindergarten students in bilingual classes and monolingual students from four independent early childhood centers and four traditional school-based early childhood programs in a large urban school district in Texas.

Specifically, there were 484 monolingual pre-kindergarten students and 616 pre-k students enrolled in bilingual classes. Students in this study were enrolled in prekindergarten programs either at independent early childhood centers or traditional school-based prekindergarten programs. Students needed to be four years-old on or before September 1 of the school year and live within each school district's attendance boundaries. Additionally, students in this study had to have met at least one of the following criteria:

- Be homeless
- Be unable to speak or understand English
- Be economically disadvantaged
- Be the child of an active-duty member of the United States military or one who has been killed, injured, or missing in action while on active duty
- Is or ever has been in the conservatorship of the Department of Family and Protective Services following an adversary hearing held as provided by Section 262.201 of the Texas Family Code
- Meet any eligibility criteria for Head Start, not only those who meet the low-income eligibility criteria for Head Start.

The independent early childhood centers and traditional school-based early childhood programs were selected based on their close proximity to one another, located within a two (2)-mile radius of each other. This selection process was intentionally done to ensure that homogeneity between the sample population groups would be as similar as possible. The similarity in neighborhood factors and demographics between the two groups were also observed to ensure minimal amounts of bias for the two independent groups.

For the purposes of this study, Frog Street literacy and mathematics assessment mastery scores for individual students for Early Childhood Center (ECC) 1 were compared against School 1; ECC 2 were compared against School 2; ECC 3 were compared against School 3; and ECC 4 were compared against School 4. Table 3 below provides the mean mastery scores of the performance of prekindergarten classes in independent early childhood centers as measured by the Frog Street Assessment during the two-year study period:

TABLE 3. Mean Mastery scores for Pre-K classes in ECC for Bilingual and Monolingual classrooms.

ECC	Monolingual Literacy Scores	Monolingual Math Scores	Bilingual Literacy Scores	Bilingual Math Scores
ECC 1	90	91	80	86
ECC 2	85	88	88	89
ECC 3	71	73	82	83
ECC 4	89	93	93	94

Likewise, Table 4 provides the mean mastery scores of the performance of prekindergarten classes in traditional school based early childhood programs as measured by the Frog Street Assessment during the two-year study period:

TABLE 4. *Mean Mastery scores for Pre-K Classes in Traditional School for Bilingual and Monolingual classrooms.*

Traditional School	Monolingual Literacy Scores	Monolingual Math Scores	Bilingual Literacy Scores	Bilingual Math Scores
School 1	91	94	82	88
School 2	87	92	90	97
School 3	80	83	82	88
School 4	85	90	90	92

Data Analysis for Research Questions

Research question one

Is there a significant difference between monolingual (English speaking only) prekindergarten students' academic literacy achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As

outlined in Table 5, the mean or M for the monolingual prekindergarten students at independent early childhood centers was equal to 87.95 with a standard deviation or SD of 7.572 and a standard error mean of 0.487. The mean or M for the monolingual prekindergarten students at the traditional school-based early childhood programs was equal to 88.96 with a standard deviation or SD of 8.034 and a standard error mean of 0.516.

Table 5. *Summary of Literacy Scores for ECC Monolingual Students and Traditional Monolingual Students.*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Monolingual Students				
In ECC Classrooms	242	87.95	7.57	.487
Monolingual Students				
In Traditional Classrooms	242	88.96	8.03	.516

As Table 6 indicates, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street literacy assessment of monolingual prekindergarten students in independent early childhood centers or those attending traditional school-based early childhood programs. Monolingual prekindergarten students who attended independent early childhood centers had a t -value of -1.421 with a level of significance or p -value of 0.156 and degrees of freedom value or df of 482. The assumption of homogeneity associated with Levine's F -test was also

tested and satisfied with a level of significance of 0.904. Again, the data reflected that there was no statistically significant difference in regards to the academic achievement of monolingual prekindergarten students as measured by the Frog Street literacy assessment.

Table 6. *Two-Sample T-Tests with Equal Variances of Frog Street Literacy Assessment Scores for Monolingual Prekindergarten Students*

	# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval	
					Lower	Upper
Monolingual Students In ECC and in Traditional Classrooms combined	484	-1008	.710	482	-2.403	.386
$t = 0.1564$						

Research question two

Is there a significant difference between monolingual prekindergarten students' academic mathematics achievement in early learning centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As outlined in Table 7, the mean or *M* for the monolingual prekindergarten students at independent early childhood centers was equal to 90.1322 with a standard deviation or

SD of 7.52252 and a standard error mean of 0.48357. The mean or *M* for the monolingual prekindergarten students at the traditional school-based early childhood programs was equal to 90.9835 with a standard deviation or *SD* of 7.43992 and a standard error mean of 0.47826.

Table 7. *Summary of Math Scores for ECC Monolingual Student and Traditional Monolingual Students.*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Monolingual Students				
in ECC Classrooms	242	90.13	7.52	.483
Monolingual Students				
in Traditional Classrooms	242	90.98	7.43	.478

As shown in Table 8, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of monolingual prekindergarten students in independent early childhood centers or those attending traditional school based early childhood programs. Monolingual prekindergarten students who attended independent early childhood centers had a *t*-value of -1.252 with a level of significance or *p*-value of 0.211 and degrees of freedom value or *df* of 482. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.887. Again the data reflected that there was no statistically significant difference in regards to the academic achievement of

monolingual prekindergarten students as measured by the Frog Street mathematics assessment.

Table 8. *Two-Sample T-Tests with Equal Variances of Frog Street Math Assessment Scores for Monolingual Prekindergarten Students*

	# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval	
					Lower	Upper
Monolingual Students In ECC and in Traditional Classrooms combined	484	-.8512	.680	482	-2.18	.485

$t = 0.211$

Research question three

Is there a significant difference in academic literacy achievement between prekindergarten students enrolled in bilingual classes as measured by the Frog Street Assessment compared to those prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?

An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As outlined in Table 9, the mean or *M* for the bilingual prekindergarten students at independent early childhood centers was equal to 90.03 with a standard deviation or *SD* of 7.978 and a standard error mean of 0.455. The mean or *M* for the bilingual prekindergarten students

at the traditional school-based early childhood programs was equal to 90.19 with a standard deviation or *SD* of 8.353 and a standard error mean of 0.476.

Table 9. *Summary of Literacy Scores for Pre-K Students in Bilingual Classrooms for ECC and Traditional Schools*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Pre-K Students in Bilingual				
ECC Classrooms	308	90.03	7.97	.455
Pre-K Students in Bilingual				
Traditional Classrooms	308	90.19	8.35	.476

As Table 10 indicates, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street literacy assessment of bilingual prekindergarten students in independent early childhood centers or those attending traditional school based early childhood programs. Bilingual prekindergarten students who attended independent early childhood centers had a *t*-value of -.242 with a level of significance or *p*-value of 0.809 and degrees of freedom value or *df* of 614. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.306. Again the data reflected that there was no statistically significant difference in regards to the academic achievement of bilingual prekindergarten students as measured by the Frog Street literacy assessment.

Table 10. Two-Sample *T*-Tests with Equal Variances of Frog Street Literacy Scores for Pre-K Students in Bilingual Classrooms for ECC and Traditional Schools

	# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval	
					Lower	Upper
Students in ECC and in Traditional Bilingual Classrooms combined	616	-.159	.658	614	-1.452	1.133

$t = 0.809$

Research question four

Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?

An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As outlined in Table 11, the mean or *M* for the bilingual prekindergarten students at independent early childhood centers was equal to 91.40 with a standard deviation or *SD* of 8.148 and a standard error mean of 0.464. The mean or *M* for the bilingual prekindergarten students at the traditional school based early childhood programs was equal to 91.69 with a standard deviation or *SD* of 8.766 and a standard error mean of 0.499.

Table 11 *Summary of Math Scores for Pre-K Students in Bilingual Classrooms for ECC and Traditional Schools*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Pre-K Students in Bilingual				
ECC Classrooms	308	91.40	8.14	.464
Pre-K Students in Bilingual				
Traditional Classrooms	308	91.69	8.76	.499

As Table 12 shows, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those attending traditional school-based early childhood programs. Bilingual prekindergarten students who attended independent early childhood centers had a t -value of $-.424$ with a level of significance or p -value of 0.672 and degrees of freedom value or df of 614 . The assumption of homogeneity associated with Levine's F -test was also tested and satisfied with a level of significance of 0.481 . Again the data reflected that there was no statistically significant difference in regards to the academic achievement of bilingual prekindergarten students as measured by the Frog Street mathematics assessment.

Table 12. *Two-Sample T-Tests with Equal Variances of Frog Street Math Score for Pre-K Students in Bilingual Classrooms for ECC and Traditional Schools*

	# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval	
					Lower	Upper
Students in ECC and in Traditional Bilingual Classrooms combined	616	-.289	.682	614	-1.628	1.050

$t = 0.672$

Research question five

Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early childhood center at the end of the school year?

An independent two-sample t -test with equal variances not assumed was conducted to determine whether there was a significant difference between the two groups. As outlined in Table 13, the mean or M for the bilingual prekindergarten students at independent early childhood centers was equal to 91.3994 with a standard deviation or SD of 8.14844 and a standard error mean of 0.46430. The mean or M for the monolingual prekindergarten students at the independent early childhood centers was

equal to 90.1322 with a standard deviation or *SD* of 7.52252 and a standard error mean of 0.48357.

Table 13. *Summary of Math Scores for Pre-K Students in Bilingual Classrooms for ECC and Pre-K Students in Monolingual Classrooms in ECC.*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Pre-K Students in Bilingual				
ECC Classrooms	308	91.40	8.14	.464
Pre-K Students in Monolingual				
ECC Classrooms	242	90.13	7.52	.483

As can be seen in Table 14, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those monolingual prekindergarten students attending independent early childhood centers. Bilingual and monolingual prekindergarten students who attended independent early childhood centers had a *t*-value of 1.890 with a level of significance or *p*-value of 0.059 and degrees of freedom value or *df* of 533.943. a reflected that there was no statistically significant difference in regards to the academic achievement of bilingual and monolingual prekindergarten students as measured by the Frog Street mathematics assessment.

Table 14 *Two-Sample T-Tests with No Equal Variances of Frog Street Math Score for Pre-K Students in Bilingual Classrooms and Monolingual students in ECC.*

		# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval Lower Upper	
Students in ECC							
Bilingual Classrooms							
And Students in							
Monolingual ECC							
Classroom	combined	550	1.267	.670	533	-.0497	2.584
$t = 0.059$							

Research question six

Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

An independent two-sample *t*-test with equal variances not assumed was conducted to determine whether there was a significant difference between the two groups. As outlined in Table 15, the mean or *M* for the bilingual prekindergarten students at independent early childhood centers was equal to 91.40 with a standard deviation or *SD* of 8.148 and a standard error mean of 0.464. The mean or *M* for the monolingual prekindergarten students at the traditional school based early childhood

programs was equal to 90.98 with a standard deviation or *SD* of 7.440 and a standard error mean of 0.478.

Table 15. *Summary of Math Scores for Pre-K Students in Bilingual Classrooms for ECC and Pre-K Students in Monolingual classrooms in Traditional Schools.*

Variable	# of Students	Mean	Std. Deviation	Std. Error Mean
Pre-K Students in Bilingual				
ECC classrooms	308	91.40	8.14	.464
Pre-K Students in Monolingual				
Traditional Classrooms	242	90.98	7.44	.478

As Table 16 displays, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those monolingual students attending traditional school-based early childhood programs. Bilingual and monolingual prekindergarten students had a *t*-value of 0.624 with a level of significance or *p*-value of 0.533 and degrees of freedom value or *df* of 535.761. Again, the data reflected that there was no statistically significant difference in regards to the academic achievement of bilingual and monolingual prekindergarten students as measured by the Frog Street mathematics assessment.

Table 16. *Two-Sample T-Tests with Equal Variances Not Assumed of Frog Street Math Score for Pre-K Students in Bilingual Classrooms in ECC and Monolingual students in Traditional Schools*

	# of Students	Mean Difference	Std Err.	Degrees of Freedom	95% Confidence Interval	
					Lower	Upper
Students in ECC Bilingual Classrooms And Students in Monolingual traditional Classrooms combined	550	.416	.667	535	-.894	1.725
$t = 0.533$						

Summary

The key findings in this study showed that there were no statistically significant differences in regards to academic achievement for bilingual or monolingual prekindergarten students attending either independent early learning centers or traditional school-based early childhood programs as measured by the Frog Street mathematics and literacy assessments. This study used descriptive statistics to summarize and describe the raw data, but analyzed the descriptive data using an inferential statistics design to properly achieve the study's results. Independent sample *t*-tests were utilized to determine whether a statistically significant difference could be ascertained between the two independent groups. In this particular study, the independent variable (the academic

setting, such as the independent early learning center or the traditional school-based early childhood program) was tested to determine whether it had a significant effect on the academic achievement (the dependent variable) of the prekindergarten student. The specific findings for each of the research questions in this study are as follows:

1. There was **no** statistically significant difference between monolingual prekindergarten students' academic literacy achievement in early learning centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.
2. There was **no** statistically significant difference between monolingual prekindergarten students' academic mathematics achievement in early learning centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.
3. There was **no** statistically significant difference in academic literacy achievement as measured by the Frog Street Assessment between prekindergarten students in bilingual classes in early learning centers compared to those prekindergarten students in bilingual classes in a traditional elementary school at the end of the school year.
4. There was **no** statistically significant difference academic math achievement as measured by the Frog Street Assessment between prekindergarten students in bilingual classes in early learning centers compared to those prekindergarten

students in bilingual classes in a traditional elementary school at the end of the school year.

5. There was **no** statistically significant difference in academic mathematics achievement between prekindergarten students in bilingual classes in early learning centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early learning center at the end of the school year.
6. There was **no** statistically significant difference in academic mathematics achievement between prekindergarten students in bilingual classes in early learning centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.

Results revealed that no statistically significant differences existed in regards to the academic achievement of bilingual and monolingual prekindergarten students in either of the academic settings as measured by the Frog Street literacy and math assessments. The study further revealed that the independent variable (the early childhood center or the traditional school) did not have an impact on the dependent variable (the literacy and math academic achievement of the prekindergarten students).

CHAPTER FIVE

CONCLUSION

This chapter will provide a brief discussion of the purpose of the study, a description of the research questions that were the focal point of this study, and a brief summary of the findings for each research question. In addition, a review of the study's design and statistical analyses that were used will be included, as well as a brief description of the population sample and a discussion of the results. The chapter will conclude with a discussion on the limitations encountered during the study, implications for school leaders and schools, and recommendations for future research.

Purpose of the Study

The purpose of this study was to determine whether significant differences exist in the academic achievement of prekindergarten students in independent early childhood centers and traditional school-based early childhood programs as measured by the Frog Street Assessment in the areas of literacy and mathematics. As an increasing number of independent early childhood centers have been created for the express purpose of responding to the population's needs of the youngest students in education, scarce research exists to evidence and trace the effects of these independent early learning centers. Numerous research studies have been conducted to demonstrate the effectiveness of early childhood education but a gap in the knowledge exists as it pertains to the potential effects of creating independent early childhood centers. The following research questions were used during the course of this study:

1. Is there a significant difference between monolingual (English speaking only) prekindergarten students' academic literacy achievement in early childhood

centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

2. Is there a significant difference between monolingual (English-speaking only) prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?
3. Is there a significant difference in academic literacy achievement between prekindergarten students enrolled in bilingual classes as measured by the Frog Street Assessment compared to those prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
4. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to prekindergarten students enrolled in bilingual classes in a traditional elementary school at the end of the school year?
5. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early childhood center at the end of the school year?

6. Is there a significant difference in academic mathematics achievement between prekindergarten students enrolled in bilingual classes in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year?

This study utilized a causal-comparative non-experimental research design to analyze the relationship between the independent variable and the dependent variable. The independent variable in this study was the academic setting and the dependent variable was the academic achievement of bilingual and monolingual prekindergarten students as measured by the Frog Street literacy and mathematics assessments. Below is a brief summary of the findings for each of the research questions presented in this study:

- There was **no** statistically significant difference between monolingual prekindergarten students' academic literacy achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.
- There was **no** statistically significant difference between monolingual prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.
- There was **no** statistically significant difference between bilingual prekindergarten students' academic literacy achievement in early childhood centers as measured

by the Frog Street Assessment compared to those bilingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.

- There was **no** statistically significant difference between bilingual prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those bilingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.
- There was **no** statistically significant difference between bilingual prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in an early learning center at the end of the school year.
- There was **no** statistically significant difference between bilingual prekindergarten students' academic mathematics achievement in early childhood centers as measured by the Frog Street Assessment compared to those monolingual prekindergarten students enrolled in a traditional elementary school at the end of the school year.

Key Findings

An independent samples *t*-test for each of the research questions was conducted which showed there was no statistically significant difference for all of the comparison groups. The level of significance was set at $p < 0.05$. Below is a more detailed analysis of the findings, as discussed in Chapter 4:

Monolingual vs. Monolingual, Literacy. An independent two samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street literacy assessment of monolingual prekindergarten students in independent early childhood centers or those monolingual students attending traditional school-based early childhood programs. Monolingual prekindergarten students who attended independent early childhood centers had a *t*-value of -1.421 with a level of significance or *p* value of 0.156 and degrees of freedom value or *df* of 482. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.904.

Monolingual vs. Monolingual, Mathematics. An independent two samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of monolingual prekindergarten students in independent early childhood centers or those monolingual students attending traditional school-based early childhood programs. Monolingual prekindergarten students who attended independent early childhood centers had a *t*-value of -1.252 with a level of significance or *p*-value of 0.211 and degrees of freedom value or *df* of 482. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.887.

Bilingual vs. Bilingual, Literacy. An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street literacy assessment of bilingual prekindergarten students in independent early childhood centers or those bilingual students attending traditional school-based early childhood programs. Bilingual prekindergarten students who attended independent early childhood centers had a *t*-value of -.242 with a level of significance or *p*-value of 0.809 and degrees of freedom value or *df* of 614. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.306.

Bilingual vs. Bilingual, Mathematics. An independent two-samples *t*-test with equal variance was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those bilingual students attending traditional school-based early childhood programs. Bilingual prekindergarten students who attended independent early childhood centers had a *t*-value of -.424 with a level of significance or *p*-value of 0.672 and degrees of freedom value or *df* of 614. The assumption of homogeneity associated with Levine's *F*-test was also tested and satisfied with a level of significance of 0.481.

Bilingual ECC vs. Monolingual ECC, Mathematics. An independent two-samples *t*-test with equal variances not assumed was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those monolingual students attending independent early childhood centers. Bilingual and monolingual prekindergarten students who attended independent early childhood centers had a *t*-value of 1.890 with a level of significance or *p* value of 0.059 and degrees of freedom value or *df* of 533.943.

Bilingual ECC vs. Monolingual Traditional, Mathematics. An independent two-samples *t*-test with equal variances not assumed was conducted to determine whether there was a significant difference between the two groups. As a result of performing independent samples *t*-tests for the two groups, there was no statistically significant difference in terms of the academic achievement as measured by the Frog Street mathematics assessment of bilingual prekindergarten students in independent early childhood centers or those monolingual students attending traditional school-based early childhood programs. Bilingual and monolingual prekindergarten students had a *t*-value of 0.624 with a level of significance or *p*-value of 0.533 and degrees of freedom value or *df* of 535.761.

Results revealed that no statistically significant differences existed in regards to the academic achievement of bilingual and monolingual prekindergarten students in either of the academic settings as measured by the Frog Street literacy and math

assessments. The study further revealed that the independent variable (the early childhood center or the traditional school) did not have an impact on the dependent variable (the literacy and math academic achievement of the prekindergarten students).

Limitations

Some of the limitations which were encountered during the course of this research included the sample of data being used. For example, bilingual and monolingual student body data had different pools due to their disparate population sizes. Bilingual student data included more student subjects in the population in comparison to monolingual student data as evidenced by enrollment rates for the two year period in this study. Data might also be skewed for some of the early childhood centers in the sample where it had classrooms with an additional Head Start instructor. Early childhood centers that had classrooms with Head Start instructors were excluded in order to ensure homogeneity of the data sets. These classrooms generally have one Head Start instructor and additional teaching assistants on a permanent basis which are not present in a regular early childhood classroom.

Other groups that were excluded from the study included special education populations/students, students from the PALS (Preschoolers Achieving Learning Skills) program, or classrooms which consisted of teaching assistants. Selection for each of the groups took into account the intention to create homogenous groups for accurate comparisons. As a result of this limitation, generalizations beyond the bilingual and monolingual classrooms cannot be applied for these special groups that possess these characteristics.

Monolingual prekindergarten students in independent early childhood centers were compared against monolingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Bilingual prekindergarten students in independent early childhood centers were compared against bilingual prekindergarten students in traditional comprehensive school settings in the areas of literacy and math. Additionally, a cross comparison was made between bilingual prekindergarten students in early childhood centers and monolingual prekindergarten students in traditional comprehensive school settings in the area of math. Finally, monolingual prekindergarten students in early childhood centers were compared against bilingual prekindergarten students in early childhood centers in the area of math.

Implications for Schools and School Leaders

The results of this study for schools and school leaders draw a few implications that demonstrate the need to invest more efforts and resources in early childhood education. An implication can be drawn that early childhood education is beneficial and vitally important to the foundation of students' academic success. Although the study found that there were no statistically significant differences in the academic literacy or math achievement in prekindergarten students that were enrolled in early childhood centers or traditional based schools, the value of early childhood education and its importance are apparent.

Large cities such as San Antonio in Texas have adopted city-wide legislative measures that require full day prekindergarten classes for low income students beginning at the age of four years old. The Pre-K 4 SA program was placed on the ballot measure in the fall of November 2012 (Pre-K 4 SA, 2014). Taxpayers voted whether to allocate a

small portion of their property taxes to fund the initiative. Consequently, the measure passed and began implementation in 2013 (Pre-K 4 SA, 2014). San Antonio began implementing full day prekindergarten centers, dedicated solely in the efforts of preparing low-income and at-risk students with the foundation of a quality early childhood education (Pre-K 4 SA, 2014).

Although a study has not been conducted in measuring the effectiveness of these full day prekindergarten centers, research has shown the positive effects and outcomes of providing full day prekindergarten to students of similar demographics and its lasting effects.

Similarly in Houston, in 2013, a full day prekindergarten measure was also placed on the ballot to urge taxpayers to decide whether to fund an intensive prekindergarten program for low income students in the Harris County area through the apportionment of property taxes. Unfortunately, the measure failed to pass but supporters of the campaign, known as Early to Rise, are seeking ways in which it can be passed in the near future. Again, the importance of early childhood education has become apparent for local political leaders, educational practitioners, and families in need of such services.

Another implication from this study is the balance of creating accountability measures with developmentally appropriate practices for the early childhood student. The standardization of curriculum and learning objectives for students in the upper elementary grade levels has produced harsh results for the individual student (Hatch, 2002). School leaders should take into account the developmental needs of the early young child and involve the input, knowledge, and expertise of early childhood practitioners to create instruments that would adequately measure the impact of

instruction on student achievement and respond appropriately to the developmental needs of the young child. This balance could provide beneficial results in measuring teacher and student success as well as provide a basis on which to establish sound instruction for the early childhood student.

School leaders should also take into consideration the benefits of having high quality early childhood classrooms that can benefit students in the early childhood grade levels. As previously discussed in this study, several high quality factors were deemed as uncontrolled variables for the purposes of this study. Those high quality factors were: low student-teacher ratio, adequate time for teachers to reflect and practice new methods and instructional strategies, learner-centered environments, differentiated instruction, and strong relational ties between the school and home to help solidify academic success (Brooks-Gunn, 2000; Karoly, 1988; McCartney, 2007; Reynolds, 2002; Yoshikawa, 1995). Additional research in this area has also noted other characteristics: explorations, guided discovery activities, problem solving activities, discussions, demonstrations, and direct instruction (Kostelnik & Grady, 2009).

Thus, the final implication that can be drawn from this study would be the need to involve additional factors in gauging the effectiveness of early childhood education when comparing classrooms against one another within the same academic setting or comparing classrooms against other classrooms in different academic settings. Apart from the literacy and mathematics skill sets that were measured by the Frog Street Assessment, other classroom factors should also be considered in gauging the effectiveness of the classroom for the early young child. For example, a high quality early childhood classroom may possess characteristics that distinguishes it from low

quality early childhood classroom settings. Incorporating these characteristics in measuring effectiveness in early childhood classrooms could provide consistency in the area of early childhood education.

Recommendations

In completing the investigation of the study's purpose, it was discovered that several recommendations became apparent to potentially improve early childhood education and to provide a means of enhancing current practices that are being implemented in independent early childhood centers or in traditional schools. One of the recommendations as the results became apparent that the traditional schools fared slightly better on average in terms of mastery scores in the areas of literacy and math as measured by the Frog Street assessment was to perhaps open and broaden the lines of communication between two settings. The results from the Frog Street assessment data showed that students from some of the traditional schools performed slightly better than the independent early childhood centers. The recommendation here would be to share best practices amongst the campuses in order to provide the best instruction possible to all students in early childhood education.

Another recommendation would be in the area of standardizing the high quality characteristics in the early childhood classroom to create a more uniform system of measuring early childhood classrooms. Currently, school districts such as the one involved in this study employ an appraisal system for teachers that measure their effectiveness and their impact on student achievement by observing certain behaviors, methods, and factors in the classroom. Unfortunately at this time, the high quality

characteristics as mentioned previously in this study are not incorporated in these appraisal systems for teachers.

The standardization of such criteria would allow for instructional leaders to look for high quality characteristics in the classroom and to advocate for such characteristics to become much more apparent in all early childhood classrooms. Again, the study could not provide for such information due to insufficient data. Having this type of system in place could provide standards and a baseline from which improvements could be made to the current state of early childhood education in school districts across the state.

A final recommendation would be in the area of professional development and teacher support. The intent to maintain high quality early childhood classrooms can be supplemented with the offering of relevant and useful professional development opportunities for early childhood teachers. Along the same lines of the Frog Street curriculum and assessment trainings, additional trainings could be developed and offered to new and veteran early childhood teachers. These trainings could assist new and current early childhood teachers in improving their instructional strategies and practices in finding various ways to incorporate the high quality characteristics of an early childhood classroom in their daily practices. More professional development opportunities could be offered to other instructional leaders and teachers outside of early childhood education to inform them of their practices and to provide depth to the importance of early childhood education.

Conclusion

Results revealed that no statistically significant differences existed in regards to the academic achievement of bilingual and monolingual prekindergarten students in

either of the academic settings as measured by the Frog Street literacy and math assessments. The study further revealed that the independent variable (the early childhood center or the traditional school) did not have an impact on the dependent variable (the literacy and math academic achievement of the prekindergarten students).

In recent years, the push for accountability and standardization of student learning in public education has detrimentally impacted early childhood education (Goldstein, 2007). Early childhood education in the elementary school scheme slowly became a forgotten area of education. Currently, with the high demand for enrollment of early childhood students in public schools was the demand to ensure that a quality education was being offered to students in these grade levels. Although no statistically significant differences were prevalent in this study, it may have contributed to the need of studying similar issues in the area of early childhood education such as providing additional support and professional development opportunities to new and current teachers in the field or begin the conversation in investigating ways in which the characteristics of a high quality early childhood classroom could be incorporated in an appraisal system.

Although the high quality characteristics of the early childhood classroom were uncontrolled variables in this study, certain initiatives, programs, and resources helped to offset them. Namely, school district enrollment caps, Frog Street trainings for the implementation of the curriculum and administration of the assessment, school district professional learning communities, and federal mandates such as Title I, Part A were a few of the concrete examples that were cited to offset the nature of these uncontrolled variables.

Early childhood education has established its effects, benefits, and cost-benefit analyses in the area of education and its importance and relevance is evident through the various topics as discussed in Chapter Two of this study. Again, despite the findings that no statistically significant differences existed in terms of the academic achievement for prekindergarten students in early childhood centers or in traditional schools, the emphasis on the importance of offering early childhood education to students especially in low income communities is apparent.

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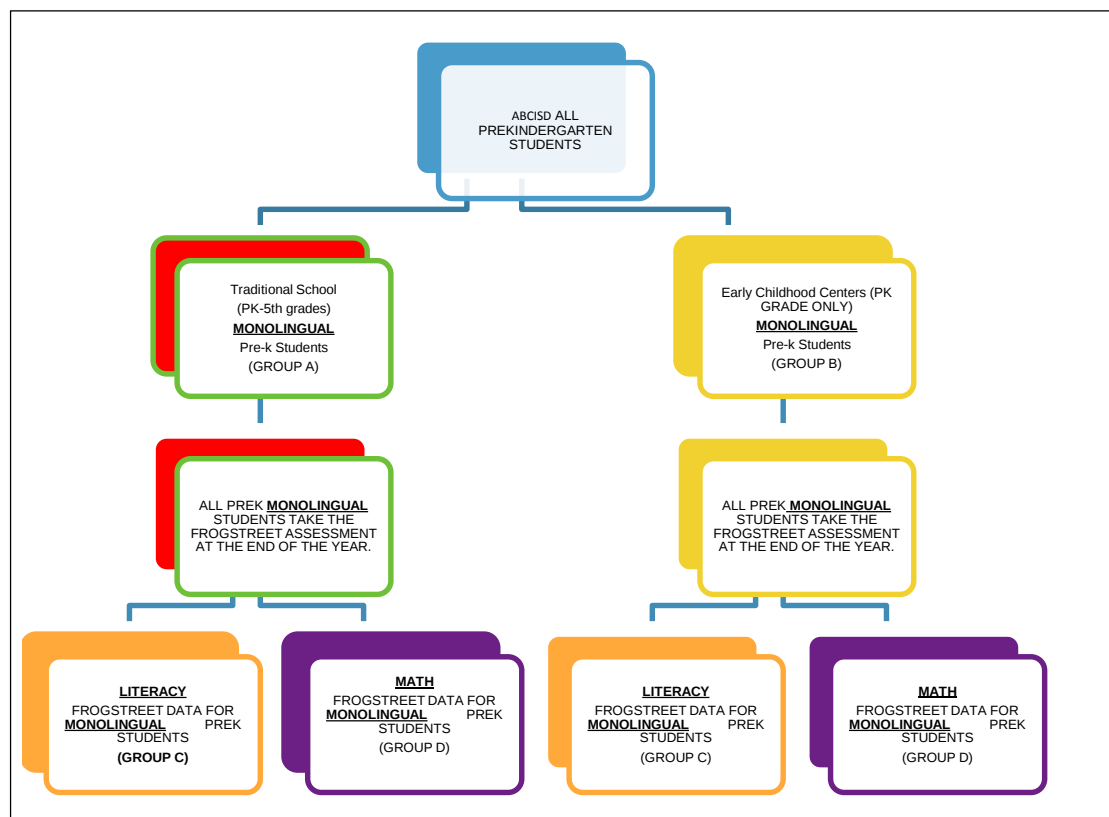
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APPENDICES

APPENDIX A

DIAGRAM FOR RESEARCH QUESTIONS 1-2



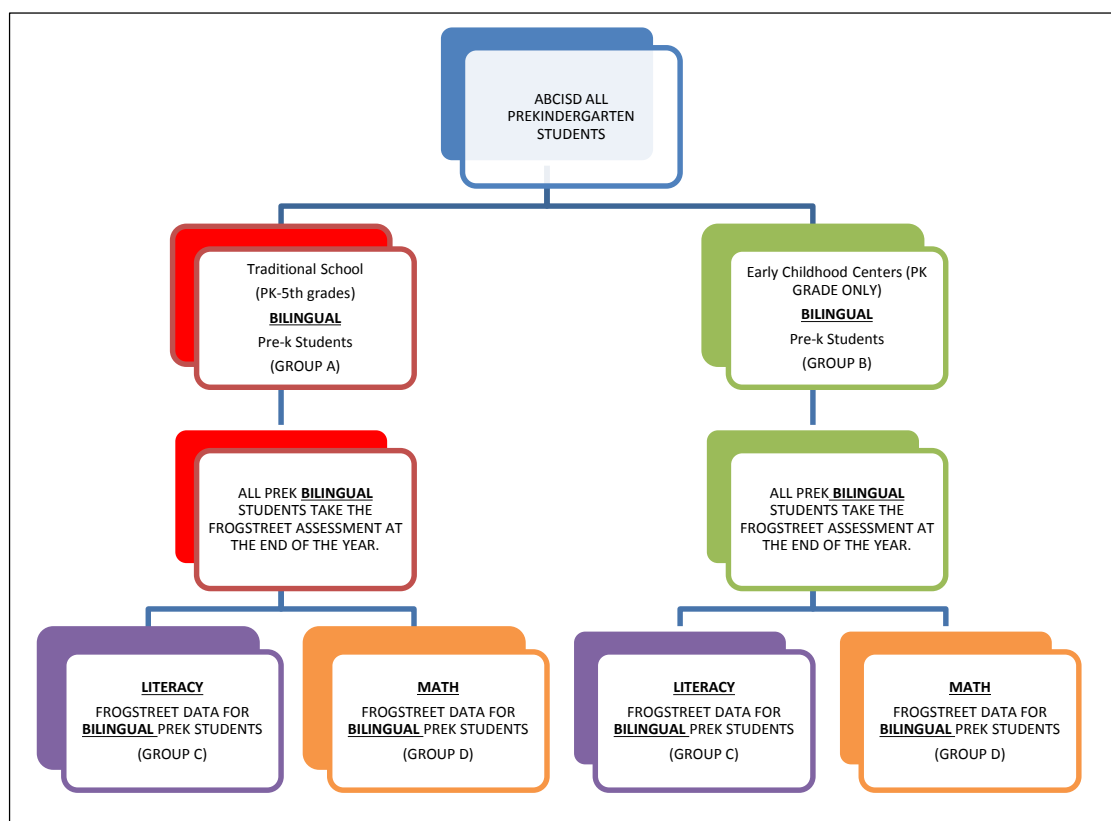
For the purposes of this study the following comparisons will be made to determine whether a significant difference exists between prekindergarten MONOLINGUAL students that are in GROUP A and MONOLINGUAL students in GROUP B:

Students in Group C will be compared against one another to determine if a significant difference exists.

Students in Group D will be compared against one another to determine if a significant difference exists.

Again, the purpose of the study is to determine whether the INDEPENDENT variable (Group A or Group B) has an effect on the DEPENDENT variable, students in Group C or Group D.

DIAGRAM OF RESEARCH QUESTIONS 3-4



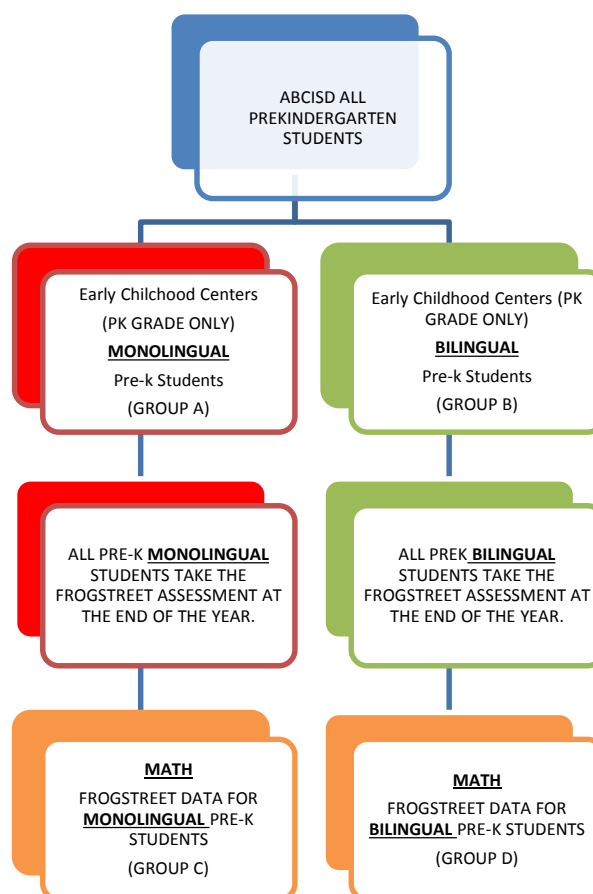
For the purposes of this study the following comparisons will be made to determine whether a significant difference exists between prekindergarten BILINGUAL students that are in the GROUP A and BILINGUAL students in the GROUP B:

The Group C will be compared against one another to determine if a significant difference exists.

The Groups D will be compared against one another to determine if a significant difference exists.

Again, the purpose of the study is to determine whether the INDEPENDENT variable (Group A or Group B) has an effect on the DEPENDENT variable, students in Group C or Group D.

DIAGRAM OF RESEARCH QUESTION 5

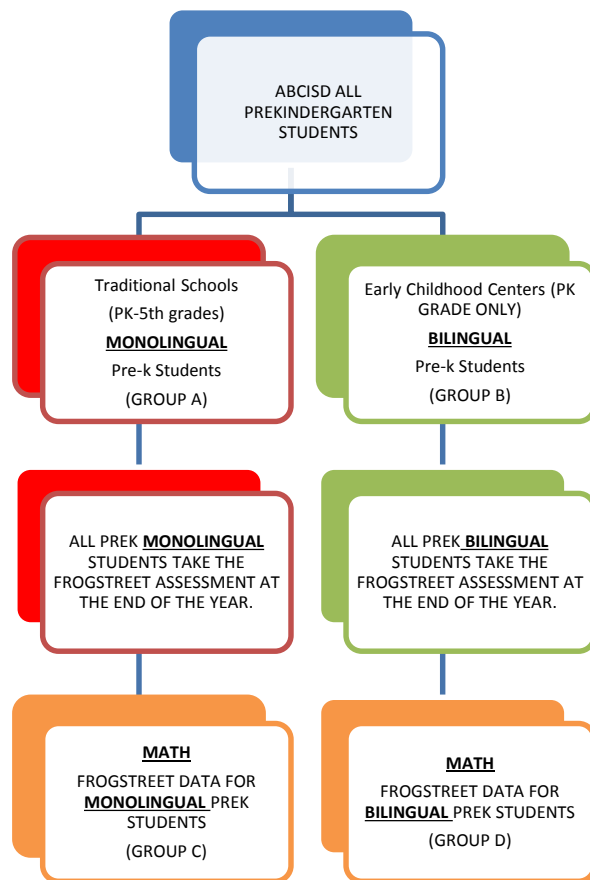


For the purposes of this study the following comparisons will be made to determine whether a significant difference exists between prekindergarten MONOLINGUAL students that are in GROUP A and BILINGUAL students in GROUP B:

Students in Group C will be compared against Group D to determine if a significant difference exists.

Again, the purpose of the study is to determine whether the INDEPENDENT variable (Group A or Group B) has an effect on Group C or Group D.

DIAGRAM OF RESEARCH QUESTION 6



For the purposes of this study the following comparisons will be made to determine whether a significant difference exists between prekindergarten MONOLINGUAL students that are in GROUP A and BILINGUAL students in GROUP B:

Students in Group C will be compared against Group D to determine if a significant difference exists.

Again, the purpose of the study is to determine whether the INDEPENDENT variable (Group A or Group B) has an effect on Group C or Group D.