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Early Interventions and Student Achievement

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

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Abstract

Educating children is a costly endeavor; however, when children with special needs enter kindergarten unprepared emotionally, socially, or academically, the increased costs and support systems have to be absorbed by the schools and communities. The purpose of this study was to determine if there was a significant difference between the academic achievement of students participating in Early Childhood Special Education (ECSE) compared to students without ECSE services with DIAL-3 scores ranked in the 20th percentile or below. Achievement scores for second and third graders in one urban school district were utilized to compare the scores of ECSE and non-ECSE students. The sample included the TerraNova and Performance Series assessment scaled scores of 30 ECSE students and 30 non-ECSE students for a total of 60 students from academic years 2008 to 2012 from the participating school district. A stratified sampling was utilized within the two groups of students' assessment scores. Standard calculations included means, standard deviations, and a *t*-test. When comparing the second grade achievement scores, ECSE students had statistically significant gains on the overall scaled scores than the non-ECSE students. When comparing the third grade Performance Series reading, language arts, and math scaled scores of the ECSE students to the non-ECSE students, the ECSE students had statistically higher achievement scaled scores compared to the non-ECSE students. When comparing the third grade Performance Series reading and language arts standard item pool scores of the ECSE students to the non-ECSE students, the ECSE students had statistically higher achievement standard item pool compared to the non-ECSE students. The Performance Series standard item pool scores were not statistically significant between the two groups.

Table of Contents

List of Tables

List of Figures

Chapter One: Introduction

The importance of equipping young children with the skills necessary to enter kindergarten ready to succeed has been valued by educators, families, and stakeholders for many years. As a result, accessibility of early childhood programs has increased throughout the country (O'Brien & Dervarics, 2011). The cost to invest in high-quality educational opportunities for young children prior to kindergarten and throughout the school years is an expensive and vital endeavor (U.S. Department of Education, [USDOE], 2013a). However, when children are unprepared emotionally, socially, or academically, the increased costs and supports have to be absorbed by the schools and communities (USDOE, 2012c). Additional costs and responsibilities are placed on school districts when children with special needs enter kindergarten often lacking the school readiness skills required to be successful learners (USDOE, 2012c).

School readiness skills are attributed to more than just pre-academics (National Association for the Education of Young Children, [NAEYC], 2009). Readiness skills included cognition, mental and physical health, fine motor, as well as social and emotional wellbeing (NAEYC, 2009). In order to make a lasting impact on a child's school readiness, the influences of family and community supports are needed (O'Brien & Dervarics, 2011). The NAEYC (2009) indicated the prerequisite for "ensuring that children are ready for successful school experiences is one of the most pressing issues in early childhood policy and practice" (p. 1).

The need to commit and embrace a high standard of educational opportunities for all children to access is a foundational component of school readiness (NAEYC, 2009). Effective early intervention programs are designed to provide children with learning opportunities to meet their developmental needs (NAEYC, 2012a). Although the

participation rate has increased in early educational programs and services, the need to increase school readiness skills for all pre-kindergarten students continues to exist (O'Brien & Dervarics, 2011).

The entry rate of three and four-year olds attending a preschool or nursery program have more than doubled in a 40-year time span to 53% as of 2010 (U.S. Department of Education [USDOE], 2012c). Early intervention programs have emerged as the main source of family support and education for children under five years of age with disabilities (National Institute for Early Education Research [NIEER], 2013). Early childhood educators are challenged "to take on the role of critical reflectors in a world where change is always taking place" (p. 462). The early childhood practices and supports from teachers "should address the children's needs and diversity, giving them the rights that they deserve, as they continue to construct their identity" (Ebbeck & Chan, 2011, p. 462).

Background of the Study

A child's experiences throughout the first few years of life impact a child's school readiness to enter kindergarten. As society continues to improve educationally through legislation, such as No Child Left Behind, preparing the newest generation is a key component to a child's success. Funding is vital to provide high-quality services in the early years of a child's development. However, lack of funding is a concern for early childhood programs. Walsh and Sanchez (2010) stated, "Finding funding sources to support interventions and programs are major challenges" (p. 289).

Children with special needs or disabilities are not given equal opportunities to access educational programs (USDOE, 2012a). The laws and funding have changed

markedly over time for all students (USDOE, 2012a). In 1975, more than one million children were excluded from educational opportunities based on disabilities (USDOE, 2012a). Consequently, the Education for All Handicapped Children Act of 1975 (EAHCA), or Public Law 94-142, was legislated (EAHCA, 1975). This law required all states which receives federal funding to provide a free appropriate public education for all children ages six to eighteen years of age (EAHCA, 1975).

Subsequently in 1986, the law was amended to include two policies significant to early childhood special education (USDOE, 2012a). Services were added for young children with disabilities to include birth through 21-years of age, as well as essential federal funding to support the system of services ((National Dissemination Center for Children with Disabilities, 2010; 2011). In 1986, the EAHCA (1975), also known as Public Law 94-142 and the Individuals with Disabilities Act (IDEA), was amended (USDOE, 2012a). The Part C regulations of the IDEA increased access to families for early interventions services (National Dissemination of Center for Children with Disabilities, 2011).

Conceptual Framework

There are many theories related to early learning, social, emotional, and cognitive development (McLeod, 2012). Piaget's constructivism theory consists of two cognitive stages in the early years (McLeod, 2012). The first is between birth and two years old where knowledge is defined by the child's own sensory perceptions along with motor skills called the sensorimotor stage (McLeod, 2012). The preoperational stage is between two years old and six years old when a child learns to communicate using language but is

limited to a basic inability to manipulate information or understand another person's point of view (McLeod, 2012).

Vgotsky's constructivism theory was established around the same time as Piaget's (McLeod, 2013). Although there are many commonalities of constructivism, Vygotsky's theory differed from Piaget's in the following aspects: emphasis of the importance of culture, social factors, and the impact of language on cognitive abilities (McLeod, 2013).

The growth of a developing child is complex with many factors impacting school readiness. In both theories, significance is placed on the child being an active, inquisitive learner (McLeod, 2012; 2013). In addition to the early stages of learning, the cultural and social aspects are just as vital in a young child's developmental growth (McLeod, 2013). Therefore, Vygotsky's social constructivism theory has been utilized to explore the development of a young child as an individual, family member, and part of the community.

Problem Statement

Children entering kindergarten have not always been academically and socially prepared for school, and at-risk children are at an even greater disadvantage (NAEYC, 2009; 2012). One organization, South Carolina Solutions (SCS) (2012), has attempted to address this need by working with at-risk families to increase child developmental awareness and school readiness. Additionally, SCS (2012) described risks for children not ready for school entry:

> Children unprepared for school often perform poorly academically, have low self-esteem, and in the long term are at greater risk than others for unemployment, poverty, and crime. School readiness begins to

> develop early in life, well before formal schooling. Inadequate school readiness has been associated with poverty and poor health, a lack of reading materials and cognitive stimulation in the home, and cultural variation in beliefs and attitudes about education. (p. 1)

Research is available comparing interventions, such as Parents as Teachers (PAT), pre-school, or the effectiveness of early childhood teachers. In Oregon, research was completed (Nave, Nishioka, & Burke, 2009) comparing early interventions (birth to two) to Early Childhood Special Education (ECSE) services. However, to receive early interventions, children had to qualify by meeting state standards of a developmental delay in one or more areas (Nave et al., 2009). Allen (2009) examined kindergarten screening scores compared to any type of early childhood program to no early childhood services (PAT, pre-school, ECSE). Based on the means, Allen (2009) determined there was a significant increase in school readiness scores for students who participated in early childhood programs compared to students without any type of early childhood programs.

Purpose of the Study

The purpose of this study was to determine if there was a significant difference between the academic achievement of students participating in ECSE compared to students without ECSE services but with low DIAL-3 scores ranked in the 20th percentile or less in ABC school district (a pseudonym to assure anonymity). Young children going into kindergarten are not always equipped with necessary readiness skills to be successful in the school setting (Cannon & Lipscomb, 2011). However, Cantalini-Williams and Telfer (2010) stated, “High quality early childhood education learning is not just an ideal, but an essential element of the school system” (p. 4). Additionally, the National

Education Association (NEA), (2013) stated, "By providing a high-quality early childhood education and health services, students enter kindergarten ready to learn and allow the schools to focus on accelerating achievement rather than remediation" (p. 1).

Research Questions

The following research questions guided this study:

1. What is the difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

2. What is the difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

3. What is the difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

4. What is the difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

5. What is the difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

6. What is the difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

7. What is the difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

8. What is the difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

9. What is the difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

Null Hypotheses

$H1_o$ There is no difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H2_o$ There is no difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H3_o$ There is no difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H4_o$ There is no difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H5_o$ There is no difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H6$_o$ There is no difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H7$_o$ There is no difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H8$_o$ There is no difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H9$_o$ There is no difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

Definitions of Key Terms

For the purpose of this study, the following terms were defined:

Developmental Indicators for the Assessment of Learning – Third Edition. This assessment is designed to be individually administered (Pearson, 2012). The DIAL-3 is a screening instrument used in the referral process to Early Childhood Special Education and prior to kindergarten. It is normed to assess the development of children between the ages of 3 years 0 months to 6 years 11 months (Pearson Assessments, 2012).

Percentile ranks from the 1st percentile rank up to and including the 25th percentile, were considered potential developmental problems or delays (Pearson Assessments, 2012).

Early Childhood Special Education (ECSE). Children with disabilities who received all of their special education and related services in educational programs designed primarily for children with disabilities housed in regular school buildings or other community-based settings (Missouri Department of Elementary and Secondary Education [MODESE], 2011a).

Individualized Education Program (IEP). A written statement for a child with a disability which is developed, reviewed, and revised in accordance state and federal guidelines (MODESE, 2012).

Parents as Teachers (PAT). Parenting education for families with young children (newborn to kindergarten entry). The program includes home visits from a parent educator. Information on the developmental stages of the child is provided to the families (Parents as Teachers National Center, 2012).

Performance Series. The online, computer-adaptive Performance Series is both criterion-referenced and norm-referenced (EDmin, Inc., 2012). Results from the assessments provide specific grade-level feedback to the teacher and student (EDmin, Inc., 2012). The Performance Series assessments are required by the ABC school district at the beginning, middle, and end of the school year for students in grades three through eight in the areas of language arts, reading, and mathematics (EDmin, Inc., 2012).

Scaled score. The Performance Series scaled scores "are an estimate of the student's ability using the Rasch single-parameter computer adaptive model ….This is

calculated by multiplying the examinee's underlying ability estimate (in logits) by 200 and adding the result to 2500 (EDmin, Inc., n.d., p. 1).

Standard item pool. The Performance Series standard item scores "express the probability of a student correctly answering each item within the item pool for his/her enrolled grade level" (EDmin, Inc., n.d., p. 1). For example, a third grader who has a standard item pool score of 90% is projected to be able to answer 90% of the state standards at the third grade level (EDmin, Inc., n.d.). The standard items are grade-level specific (EDmin, Inc., n.d.).

TerraNova, Third Edition. This is a complete diagnostic assessment and includes norm-referenced achievement scores, criterion-referenced mastery scores, and performance-level data (McGraw-Hill, 2012).

Limitations and Assumptions

For the purpose of this study, the following limitations were identified:

Factors beyond the scope of the study. Student selection was random. However, students with partial data points were removed for the purpose of this study. Other factors included developmental issues, refusals of services, deaths, loss due to custody issues, foster care, and relocations.

Instrumentation threat. On the Performance Series, the questions are adjusted automatically as each student answers questions correctly or incorrectly. The TerraNova is a norm-referenced standardized assessment given to the class as group. The DIAL-3 is individually administered as a screening test. The assessment companies provide statements of validity and reliability.

Sample selection. The sample selection was limited to students with low DIAL-3 scores with or without ECSE services. Students were in kindergarten, first, second, and third grades during the 2008-2009, 2009-2010, 2010-2011, and 2011-2012 school years in a single school district.

Location threat. The online computer assessments were given in the computer lab with classmates. If a student was absent, then the computer assessment was completed on a different date and possibly in a different location within the school. The TerraNova was given to the class as a group with teacher-led directions. The DIAL-3 was given individually but has been given at times in a location with pre-kindergarten registration occurring at the same time.

For the purpose of this study, the following assumptions were identified:

1. It was assumed the TerraNova results were a valid indicator of the student's ability level.
2. It was assumed the Performance Series results were a valid indicator of the student's ability level.
3. It was assumed the DIAL-3 assessment results were a valid indicator of the student's ability level.
4. It was assumed the initial assessments required to determine eligibility for ECSE services were a valid indicator of the student's ability level.

Summary

School readiness and success is a goal of preparing young children academically, socially, and emotionally prior to kindergarten entry. With this preparation, significant costs are necessary in order to have high-quality educational supports and resources

(USDOE, 2013a). Without preparation and funding prior to kindergarten entry, the burden of cost is often placed on local districts and communities (USDOE, 2012c). While more young children are participating in early learning programs, crucial school readiness skills continue to lack a consistent high-quality level across the states (O'Brien & Dervarics, 2011). High-quality learning opportunities are essential to the success of students in the educational setting (Cantalini-Williams & Telfer, 2010). Furthermore, the NEA (2013) reported results of "providing a high-quality early childhood education and health services, students enter kindergarten ready to learn and allow the schools to focus on accelerating achievement rather than remediation" (p. 1).

The conceptual framework centers on the social constructivism theory of Lev Vygotsky. His works were established in the 1930s but was not widely known until the 1960s (McLeod, 2013). In Vygotsky's theory, emphasis was placed on of the importance of culture, social factors, and the impact of language on cognitive abilities (McLeod, 2013). The child is an active and inquisitive learner (McLeod, 2013).

Children are not always prepared to begin kindergarten due to deficiencies in school readiness skills. This study was conducted to determine if there was a significant difference for ECSE and non-ECSE students with DIAL-3 scores ranked in the 20th percentile or less compared to second and third grade district assessment scores. ECSE provide educational services for three to five-years old students who meet state eligibility requirements to be identified as a student with an educational disability (MODESE, 2012). Pre-academics and social skills are included in the developmentally appropriate program educated by certificated early childhood teachers (MODESE, 2012).

In Chapter Two, the literature review included components of early childhood

intervention and education. Research results included parental involvement in preparation for early learning and success. The role of brain development, social competence, and school readiness were reviewed. The funding available at state and national levels was discussed.

In Chapter Three, the focus was the methodology of the research. The population and sample size criteria were discussed in detail. The research approach to collecting and analyzing the data was documented. The secondary data gathered and analyzed included student scores from 2008 to 2012 to determine if there was a significant difference between ECSE and non-ECSE achievement levels at the second and third grade.

In Chapter Four, a review of the study design and analysis of the quantitative secondary data was presented. The TerraNova assessment scores from the end of second grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference of academic achievement scores for students with early interventions compared to students without early interventions. The overall achievement scaled scores, reading achievement scaled scores, and math achievement scaled scores were utilized to determine if there was a significant difference between the two groups of students.

The Performance Series assessments scores from the end of third grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference of academic achievement scores for students with early interventions compared to students without early interventions. Scaled scores and standard item pool scores were utilized to determine if there was a significant different between the two groups of students at the third grade level.

In Chapter Five, a summary of the study was presented. The findings of this study were revealed to determine whether there was a significant difference between the means of students who received ECSE services compared to similar peers who did not receive ECSE services as measured by the TerraNova at second grade and the Performance Series at third grade. Conclusions, implications for practice, and recommendations for future research were discussed.

Chapter Two: Review of Literature

In this chapter, the review of literature included early intervention, student achievement, and funding. There are many aspects to early intervention and how it relates to student achievement throughout the primary school years. Early childhood intervention components include families, school readiness, and social competence.

Historical Perspective

The laws and funding have changed markedly over time for students with disabilities (USDOE, 2012a). In 1975, more than one million children were excluded from educational opportunities based on disabilities (USDOE, 2012a). Consequently, the Education for All Handicapped Children Act of 1975 (EAHCA), or Public Law 94-142, was legislated (EAHCA, 1975). This law required all states that receive federal funding to provide a free appropriate public education for all children ages six to eighteen years of age (EAHCA, 1975). Subsequently in 1986, the law was amended to include two policies significant to early childhood special education (USDOE, 2012a). The Part B regulations of the IDEA added services for children with disabilities from birth to 21-years of age. The Part C regulations of the IDEA increased access to families for early interventions services (National Dissemination of Center for Children with Disabilities, 2011).

In 1990, EAHCA (PL 94-142) was amended and changed to the Individuals with Disabilities Education Act (IDEA) (USDOE, 2012a). Additional amendments were made to the IDEA in 1997 and 2004 (USDOE, 2012a). The USDOE (2012a) focused specifically on the impact the IDEA had on early childhood:

1. State-of-the-art models of appropriate programs and services for young

children with disabilities (birth to five years) and their families;

2. Individualized Family Service Plans (IFSPs) to identify and meet the unique needs of each infant and toddler with a disability and his or her family;
3. Effective assessment and teaching practices and related instructional materials for young children and their families;
4. National network of professionals dedicated to improving early intervention and preschool education at the state and local levels; and
5. Collaborating with other federal, state and local agencies to avoid duplication of efforts in providing early intervention and preschool education. (p. 7)

In 2002, the Elementary and Secondary Education Act was reauthorized resulting in the No Child Left Behind (NCLB) Act of 2001, or Public Law 107-110 (NCLB, 2002). Accountability requirements through assessments, highly-qualified teachers, and adequately yearly progress of all students are major components of NCLB (NCLB, 2002). However, a one-test assessment approach to determine annual yearly progress is a barrier to many districts and states (Duncan, 2013). Currently, 34 states and the District of Columbia can apply to renew waivers from NCLB (USDOE, 2013b). The waivers are due to expire at the end of the 2013-2014 school year (USDOE, 2013b).

Parent/Family Involvement

The significance of parent and family participation in early learning was supported by the USDOE (2013a), with President Obama's proposal of providing high-quality preschool for all and investing in high-quality infant and toddler care. One dynamic element of the early childhood educational proposal is to expand parent and family support systems for developmental learning phases (USDOE, 2013a). President

Obama's proposal of $15 billion dollars would provide collaboration between families and professionals to meet the needs of children (USDOE, 2013a).

The element of engaging families (Pushor, 2011) was added to give parents an interactive role in the educational environment. Pushor (2011) included:

> A belief in parent knowledge—the belief parents or caregivers, living in the complex context of the family, hold deep and rich knowledge of their children. The deeper kind of family engagement we seek is participating in the analysis of student achievement results, helping to establish school priorities, contributing to decisions about homework practices, and so on, requires schools lay parent knowledge alongside teacher knowledge to make more fully informed decisions on behalf of students. (p. 68)

Furthermore, emphasis was placed on open dialogues regarding each student, family, and teacher (Tveit, 2009) with a home connection. The early learning processes occur within the home environment of a young developing child (Ministry of Education, 2010). As found in the Tveit (2009) research, necessary successful collaboration includes the adaption of communication as individualized and child specific while listening to the parents' wants and needs. Information and collaboration are necessary to support parents and children in the learning process (Tveit, 2009). Hedges, Cullen, and Jordan (2011) stated, "Children's interests are stimulated by the experiences they engage in with their families, communities, and cultures" (p. 187). Goals and objectives of students with additional needs such as language or special education support are important components of successful, open dialogues (Tviet, 2009).

The Office of Special Education Programs developed an Early Childhood Outcomes (ECO) Center (USDOE, 2012b). The ECO Center was created "to promote the development and implementation of child and family outcome measures for infants, toddlers, and preschoolers with disabilities which could be used in local, state, and national accountability systems" (USDOE, 2012b, para. 1). The first family outcome is for families to recognize their child's attributes (USDOE, 2012b). The second family outcome is for families to understand their educational rights and responsibilities (USDOE, 2012b). The third family outcome is for families to understand their responsibilities in the early learning processes of their child (USDOE, 2012b). The fourth family outcome is for to understand supports are available (USDOE, 2012b). The last family outcome is for families to have accessibility of educational learning opportunities (USDOE, 2012b).

The ECO Center utilized a Family Outcomes Survey completed by parents in order to determine the effectiveness of the five family outcomes (USDOE, 2012b). Results of the Family Outcome Survey (Raspa et al., 2010) revealed progress as a result of the supportive systems in the early childhood interventions and collaboration with families and children. The Ministry of Education (2010) stated, "Parents and families are children's first and most significant teachers and role models and offer learning opportunities based on the deep knowledge they have of their children" (p. 12).

Conversely, McIntyre, Eckert, Fiese, DiGennaro-Reed, and Wildenger (2010) reported a general consensus of concern expressed by parents of students with or without special education issues; however, concerns of parents with special education issues were at a higher rate. The worries of parents with special needs children were based on overall

school readiness including following teacher directions, self-advocating, and academic and behavioral preparedness (McIntyre et al., 2010). The parents of children without special needs issues expressed apprehension at a lower rate with transitioning to a new school, peer/staff interaction, and being away from home (McIntyre et al., 2010).

Early Interventions

Early intervention "is a means of identifying and addressing the physical, emotional, social, and education needs of children birth to five-years old" (U.S. Department of Treasury, 2006, p. 261). In research completed by Geoffroy et al. (2010), the following key elements regarding early interventions were identified:

- Poor academic achievement could be attenuated by the provision of childcare to disadvantaged children.
- The putative protective effect of childcare on academic achievement at 6 to 7 years may vary by type of childcare (formal vs. informal) and as a function of mothers' level of education.
- Children of mothers with low levels of education (i.e., no high school diploma) are at an increased risk for poor academic readiness and achievement, unless they have been exposed to formal childcare (i.e., childcare center or family childcare) in comparison with those who have been cared by their mothers at home. (p. 1366)

Similarly, Mashburn, Downer, Hamre, Justice, and Pianta (2010) identified maternal education as positively associated with literacy assessment scores of pre-kindergarteners.

Children's scores were "much higher" at three years of age with a college graduate mother compared to children's scores with a high school drop-out mother, "proof of the advantage for young children of living in rich, stimulating environments" (Porter, 2013, para. 3).

Chien et al. (2010) completed a multi-state study concentrating on the engagement and outcomes of children in pre-kindergarten settings. Chien et al. (2010) found with increased teacher-directed instructional time and decreased non-teacher facilitated playtime, children demonstrated more growth with academic skills. Chien et al. (2010) also found with increased free play time, children demonstrated minimal growth as they progressed from a pre-kindergarten throughout their kindergarten education. Hattie (2009) established the success of early interventions had increased for all children when those services were intensive, systematic, and structured. However, the length of an academic day for early intervention programs and preschools vary and lack consistency from state to state (NIEER, 2013).

Furthermore, Pianta, Barnett, Burchinal, and Thornburg (2011) stated, "On average, the non-system that is preschool in the United States narrows the achievement gap by perhaps only 5% rather than the 30% to 50% that research suggests might be possible on a large scale if we had high-quality programs" (p. 50). While the overall costs of providing high-quality programming for young children are significant, the total "estimated economic value of program impacts on a child can be substantial relative to cost" (Pianta et al., 2011, p. 49). The positive impact of high-quality programs included "increased achievement test scores, decreased grade repetition and special education rates, increased educational attainment, higher adult earnings, and improvements in social

and emotional development and behavior, including delinquency and crime" (Pianta et al., 2011, p. 65).

The Ministry of Education (2010) stated, "The diverse family, socio-economic and cultural backgrounds of each child contribute to variations in the ways in which they develop and demonstrate their learning" (p. 6). McWilliam (2012) established his five-component model which addressed theory, philosophy, and research as a methodology to effective early interventions in the home setting. The components are:

(1) Understanding the family ecology;

(2) Functional intervention planning;

(3) Integrated services;

(4) Effective home visits, and

(5) Collaborative consultation to child care. (p. 1)

The early interventionists are part of a team with a focus on parent or caregiver support since children spend the majority of their time with a parent or caregiver (McWilliam, 2012). More services are not as effective as teaching the parent to be the instructor, with professional support, within the home (McWilliam, 2012).

The early interventionist model does "not spoon-feed early interventionists" (McWilliam, 2012, p. 14). However, "through policy, management, study, training, and implementation the field can provide early intervention in natural environments to achieve results" (McWilliam, 2012, p. 14). The four principles of the McWilliam model (2012) study are posed:

1. It is the regular caregivers who influence the child, and professionals can influence the family;

2. Children learn throughout the day;
3. All the intervention for the child occurs between professionals visits; and
4. It is maximal intervention the child needs, not maximal services. (p. 8)

Components of this model have "embedded interventions by group care providers [and] will increase the learning opportunities in that setting" (p. 14). Furthermore, McWilliam (2012) added, "It is the regular caregivers who influence the child, and professionals can influence the family. Children learn throughout the day. All of the intervention for the child occurs between professionals visits" (p. 8). In addition, McWilliam (2012) stated, "The results we can expect are a higher quality of life for families, owing to increased satisfaction with their routines, and more engagement, independence, and social relationships in the children" (p. 14).

The supportive responsibilities provided by early childhood specialists for young children and families are necessary to bridge the gap for at-risk children (Peterson, Milgram-Mayer, Summers, & Luze, 2010). In addition, Peterson et al. (2010) found many of the "barriers to accessing services for their children and themselves" are directly linked to "the same poverty-related factors that placed their children at higher risk for disabilities" (p. 509). Early childhood and care services are advantageous to children and families from disadvantaged backgrounds when there is a social mix of children and families from a variety of backgrounds (Valentine, Thomson, & Antcliff, 2009). In a study by Wong, Sumsion, and Press (2012), early childhood interventionists team members "considered inter-professional work contributed to positive outcomes for children and families" (p. 87).

The theories related to the development of child's social, emotional, academic, and intellect varies (McLeod, 2012). Piaget's stages of early cognition focus on two phases (McLeod, 2012). The sensorimotor stage, the initial stage, is from birth to two years old, and the knowledge base at this level is determined by a child's self-perceived sensory and motor abilities (McLeod, 2012). The preoperational stage is the final stage and occurs from two years old to six years old (McLeod, 2012). The knowledge base at this level is determined by lack of problem-solving abilities and ability to understand another person's perspective (McLeod, 2012). Another theorist present around the same time as Piaget, was Vygotsky (McLeod, 2013). The theory posed by Vygotsky focuses on other aspects of the whole child including the social and cultural significance along with the positive influence of language development on intellect (McLeod, 2013).

Child development is a complicated and complex process with long lasting effects in the educational readiness skills of a young child. Children are active, engaged participants in their learning development (McLeod, 2012; 2013). Furthermore, the importance of the social and cultural characteristics can influence the developmental skills of a young child (McLeod, 2013). The Ministry of Education (2010), reported, "Effective early learning for children arises from the development of meaningful partnerships between parents and families, teachers, early childhood educators, school leaders and the broader community" (p. 10).

According to the research conducted by Barnes and Nores (2012), the key findings of early care education for four-year old preschoolers included the following:

- 3 million children (74%) attend preschool at age 4.
- 1 million low-income children (64%) attend preschool at age 4.

- 660,000 children in poverty (64%) attend preschool at age 4.
- 720,000 children (18%) have only parental care and education at age 4.
- 390,000 low-income children (24%) have only parental care and education at age 4.
- 200,000 children in poverty (19%) have only parental care and education at age 4. (p. 2)

Barnes and Nores (2012) provided the key findings of early care education for three-year old preschoolers:

- 2.2 million children (53%) attend preschool at age 3.
- 680,000 low-income children (41%) attend preschool at age 3.
- 470,000 children in poverty (45%) attend preschool at age 3.
- 1.2 million children (28%) have only parental care and education at age 3.
- 610,000 low-income children (46%) have only parental care and education at age 3.
- 360,000 children in poverty (35%) have only parental care and education at age 3. (p. 2)

Additionally, Barnes and Nores (2012) provided the findings of early care education for two-year old preschoolers:

- 1.4 million children (34%) attend preschool at age 2.
- 420,000 low-income children (26%) attend preschool at age 2.
- 470,000 children in poverty (25%) attend preschool at age 2.

- 1.6 million children (39%) have only parental care and education at age 2.
- 900,000 low-income children (55%) have only parental care and education at age 2.
- 560,000 children in poverty (54%) have only parental care and education at age 2. (p. 2)

Barnes and Nores (2012) reported early care preschoolers in a non-relative day care setting included the following:

- 770,000 children (19%) receive non-relative care in a home at age 4, for nearly all of them (17%) this is a secondary arrangement (before or after a center).
- 620,000 children (15%) receive non-relative care in a home at age 3, for most of them (10%) this is a secondary arrangement.
- 680,000 children (17%) receive non-relative care in a home at age 2, for most of them (10%) this is their primary ECE arrangement. (p. 2)

Early childhood policies and procedures "should address the children's needs and diversity, giving them the rights that they deserve, as they continue to construct their identity" (Ebbeck & Chan, 2011, p. 462). Ebbeck and Chan (2011) determined "if one chooses to believe that the synergy arising from collaboration, coupled with a willingness to adapt to inevitable change and persevere with it, then the overall quality of early childhood education will be enhanced" (p. 462).

State Plan

Early education policies and procedures vary from state to state. According to NIEER (2013), "Over the past decade, state prekindergarten programs have grown faster than any other sector in early childhood and play an increasingly important role as part of

the larger array of early learning programs" (p. 2). However, Missouri is one of six states that have reported a decline in enrollment over the past decade (NIEER, 2013). Consequently, MODESE (n.d.) has reported "High-quality, parenting education and voluntary early childhood education are top priorities for our state" (para. 1). Moreover, MODESE (n.d.) added, "In order to create the best start possible start for Missouri's youngest learners, we must work together now for later" (para. 1).

In Missouri, the early learning guiding principles (MODESE, 2011b) were established in order to meet the needs of students in early childhood education. In the first guiding principle, "all children, from birth to kindergarten entry, have access to high-quality early childhood experiences" (MODESE, 2011b, p. 1). In the second guiding principle, the "parents are recognized as their children's first teachers and are an integral part of their children's early education experiences" (MODESE, 2011b, p. 1). In the third guiding principle, the focus is "comprehensive services build on the strengths of families" (MODESE, 2011b, p. 1).

The fourth guiding principle is "high-quality early learning programs evaluate the needs of individual children and families and provide access to comprehensive, research-based services" (MODESE, 2011b, p. 1). The fifth guiding principle is "high-quality early learning programs focus on all areas of early learning and development (social and emotional, language and literacy, cognitive, motor, health and physical well-being, as well as positive attitudes and behaviors toward learning)" (MODESE, 2011b, p. 1). The sixth guiding principle is "a strong, accessible system of professional development supports high-quality early learning" (MODESE, 2011b, p. 1).

The seventh guiding principle is “the development of high-quality early learning programs is a comprehensive and inclusive community effort” (MODESE, 2011b, p. 1). The eight guiding principle is “adequate and sustainable funding is necessary to ensure and expand high-quality experiences for all children and to provide flexibility for families (MODESE, 2011b, p. 1). In the ninth guiding principle, “transition services provide a seamless system from before birth to kindergarten entry” (MODESE, 2011b, p. 1). In the tenth guiding principle, “high-quality early learning programs implement culturally responsive practices and universal design for learning principles to promote the inclusion of infants, toddlers and preschoolers with learning differences, including children with disabilities and second-language learners (MODESE, 2011b, p. 1).

The significance of the early learning process is supported by President Obama’s proposal of high-quality educational funding for early learners (USDOE, 2013a). Through President Obama’s proposal, the state of Missouri would receive approximately $8.3 million dollars to increase home visit opportunities to connect families with professionals in support of meeting the needs of the children (USDOE, 2013a). Funding support can provide vital support systems for approximately 23,000 mothers living in poverty in Missouri with young children (USDOE, 2013a).

Parents as Teachers

The Parents as Teachers (PAT) program was piloted in Missouri in 1981 and implemented with statewide funding in 1985 (PAT National Center, 2013a). The PAT mission statement is to “provide the information, support, and encouragement parents need to help their children develop optimally during the crucial early years of life” (PAT National Center, 2013b, para. 2). In addition, the PAT program utilizes “evidenced-

based" research in order to offer the most relevant information and tools to early childhood development and education providers (PAT National Center, 2013b, para. 3). Currently, all 50 states, as well as six other countries, have implemented this program (PAT National Center, 2013a).

Studies by the PAT National Center (2012) focused specifically on evaluative feedback. The results were then divided into parent and child outcomes. The PAT impact on the parent outcomes (PAT National Center, 2012) includes an increased knowledge base regarding early childhood growth and development. The PAT outcomes also revealed PAT parents are more self-confident and more engaged in educational activities in the home and school, and PAT children have better pre-academic and social skills (PAT National Center, 2012). The children score higher on pre-entry kindergarten assessments as well as standardized assessments (PAT National Center, 2012).

At the pre-kindergarten level, the development of a child should be reviewed and assessed to determine needs for the family and child (Haidkind, Kikas, Henno, & Peets, 2011). Additionally, Haidkind et al. (2011) indicated, "It is in the child's interest such a process and support continues smoothly on transition to school as well as in primary school" (p. 70). In a similar study in a rural school district, kindergarten pre-entry scores of children who participated in early childhood programs were compared to children with no early childhood services. Allen's study (2009) revealed a statistically higher increase of pre-entry scores for children who participated in the early childhood programs compared to the scores of children with no early childhood services.

Parents may seek a variety of resources from others, such as books, pamphlets, Internet, a specific toy, or advice from another person's experience (Nichols, Nixon,

Pudney, & Jurvansuu, 2009). The value of parent involvement was expressed by Nichols et al. (2009):

> Inquiring into parents' priorities and discovering their existing resourcing practices may well assist early childhood and family service practitioners to support parents' role in children's learning and development. Seeing parents as active agents in resourcing their children, and even as resource producers, may well contribute to more equal partnerships. (p. 159)

Brain Development

Brain development plays an important role in the child's developmental growth. The growth rate of a child's brain varies from 80 to 90% development by the age of three to 90% development by the age of five (Child Welfare Information Gateway, 2009; National Center for Infants, Toddlers, and Families, 2012). The brains of young children are "expanding at an incredible rate" (Rushton, 2011, p. 93). Camilli, Vargas, Ryan, and Barnett (2010) reported the most significant effect for pre-kindergarteners who attended pre-school was in the area of cognition.

Furthermore, Rushton (2011) stated there is a significant impact educators have on the early learning brain development with "the ability to help shape a child's mind" (p. 94). The four basic principles of brain-based learning in a developmentally appropriate early childhood educational setting, as determined by Rushton (2011), are:

- Every brain is uniquely organized. By providing skills-leveled materials, those students who are below, average, and above can not only celebrate successes, but also maximize their development to venture on to more complex tasks.

- The brain is continually growing, changing and adapting to the environment. Intelligence is not fixed at birth but fluctuates throughout life, depending upon the stimulation of the environment, hormonal levels and other chemical reactions taking place throughout the body.
- A ‘brain-compatible’ classroom enables connection of learning to positive emotions. The most naturalistic way for this to occur is by allowing students to make relevant decisions and choices about their learning.
- Children’s brains need to be immersed in real life, hands-on, and meaningful learning experiences that are intertwined with a commonality and require some form of problem-solving. (p. 92)

Research on executive functioning (EF) of the brain focused on preschoolers (Fuhs & Day, 2011). The research by Fuhs and Day (2011) suggested “that interventions aimed at improving EF that take into account the predictive role of verbal ability may help young children, especially those who are living in at-risk situations, develop the necessary self-regulation skills for academic success and social competence” (p. 414). Fuhs and Day (2011) also added, “Self-regulation training that encourages verbal ability and feedback may yield optimal outcomes for preschoolers from low income homes” (p. 414).

Similarly, Welsh, Nix, Blair, Bierman, and Nelson (2010) focused on the specific information within the executive functioning with attention and working memory compared to kindergarten achievement in reading and math. In this investigation,

children were considered at-risk due to living in poverty. A concern noted by Welsh et al. (2010), was "given the finding that executive functions are an aspect of cognitive development particularly likely to be adversely affected by poverty, it may be that poor children would particularly benefit from such interventions – targeting executing functioning" (p. 51).

Early Childhood Special Education

History. In 1968, the Handicapped Children's Early Education Assistance Act of 1968 (Public Law 90-538) was signed by President Johnson. This act was "to authorize preschool and early education programs for handicapped children" (PL 90-538, 1968, p. 901). The funding for early childhood interventions for young children with disabilities was "for the development and carrying out of experimental preschool and early education programs for handicapped children" which demonstrated exemplary practices (PL 90-538, 1968, p. 901). The Handicapped Children's Early Education Assistance Act of 1968 was the "first major federal recognition of the importance of early education" (Hadadian & Koch, 2013, p. 188).

As of 1975, over one million children were not able to participate in educational opportunities based on an educational or medical disability (USDOE, 2012a). Accordingly, Public Law 94-142, or the Education for All Handicapped Children Act (EAHCA, 1975) was enacted. The law required states in receipt of federal funding to provide educational opportunities for children ages six to 18-years of age (EAHCA, 1975).

Then in 1986, PL 94-142 was revised to include additional support for early childhood special education services (USDOE, 2012a). The first part of the regulation

added services for children with disabilities from birth to 21-years of age (National Dissemination Center for Children with Disabilities, 2010). The second part of the regulations provided access to families for early interventions services (National Dissemination Center for Children with Disabilities, 2011). The National Early Childhood Technical Assistance Center (2012) accredited Congress for the implementation of IDEA to support and provide early intervention access and services to children and families in order to maximize the developmental growth of each child.

Then in 1990, Public Law 94-142 was amended to the Individuals with Disabilities Education Act (IDEA) (USDOE, 2012a). Additional modifications were implemented in the IDEA of 1997 and 2004 (USDOE, 2012a). The USDOE (2012a) focused specifically on the impact the IDEA had on early childhood included: implementation of developmentally appropriate models and programs, service plans specifically designed to meet individualized needs, developmentally appropriate instruction and assessments, support systems focused on increasing meeting the needs of children, and a framework of collaboration throughout the nation.

Transitions. Brandes, Ormsbee, and Haring (2007) quantified transitions as "more than one million between early intervention services and early childhood programs are facilitated annually for youngsters with special needs" (p. 204). Moreover, most parents did not have many concerns as their children transitioned to kindergarten (Wildenger & McIntyre, 2011). A guiding principle for Missouri's young children is for transitioning to "provide a seamless system from before birth to kindergarten entry" (MODESE, 2009, p. 1).

However, one group of parents had significant concerns when related to "socio-behavioral in nature" (Wildenger & McIntyre, 2011, p. 387). Students transitioned to the early childhood program and then were transitioned out of early childhood programs to school-age programs (Brandes et al., 2007). Wildenger and McIntyre (2011) identified transitional concerns in about half of the kindergarten classes were: "difficulty following directions 46%, a lack of academic skills 36%, disorganized home environments 35% and difficulty working independently 34%" (p. 388). Wildenger and McIntyre (2011) also reported, "These data suggest child socio-behavioral adjustment, and compliance in particular, is regarded by teachers as an area of relative difficulty and concern for incoming kindergarten students" (p. 388).

Social Competence

Bulotsky-Shearer, Fernandez, Dominquez, and Valorose (2011) identified overall concerns when "children with behavioral difficulties in pre-school classroom learning situations demonstrated significantly lower early reading fluency, language, and reading achievement across these critical transition points in elementary school" (p. 52). Similarly, Haidkind et al. (2011) stated, "Children's behavior is more difficult to measure than their early achievement" (p. 73).

Furthermore, Arslan, Durmusoglu-Saltali, and Yilmaz (2011) identified a positive outcome between "interpersonal skills related to emotional regulation, school readiness, social confidence, and family involvement" (p. 1284). There was a significant outcome between "self-control and emotional regulation, school readiness, social confidence, and family involvement" (Arslan et al., 2011, p. 1284). Camilli et al. (2010) reported positive results in the areas of social skills for pre-kindergarteners who attended pre-school

programs. There was a significant positive outcome between “verbal explanation and emotional regulation, school readiness, social confidence, and family involvement” (Arslan et al., 2011, p. 1284). Another significant positive outcome existed between “listening skills and emotional regulation, school readiness, social confidence, and family involvement” (Arslan et al., 2011, p. 1284). Therefore, it was proposed that behaviors and emotional stability improved when social skills were improved upon (Arslan et al., 2011).

Furthermore, significant improvements were noted in the areas of social and emotional growth, which included the bond between students and their service providers (Valentine et al., 2009). However, Burchinal, Vandergrift, Pianta, and Mashburn (2010) stated, “Children may not obtain social and academic benefits from pre-kindergarten experiences unless the teacher maintains high-quality teacher–child interactions and at least moderate- to high-quality instruction” (p. 175). Behavioral management strategies were implemented which also increased instructional time in pre-academics (Burchinal et al., 2010). In the Oregon study, Nave et al. (2009) found early intervention and special education students had the lowermost scores of all students assessed in the area of social and emotional skills.

School Readiness

The attributes of school readiness varies throughout the nation and over time (Docket & Perry, 2009). Readiness skills encompass more than an individual child (Docket & Perry, 2009). The NEA (2013) “believes that the achievement gap can be prevented via a high-quality school readiness program” (p. 1). The elements of school readiness requires “redefining readiness as a characteristic of child, school, family and

community supports and interactions also redefines the expectations of all involved" (Docket & Perry, 2009, p. 25). Furthermore, Docket and Perry (2009) stated, "Such a definition rejects notions of individual children being labeled ready or not, in favor of a much more collaborative approach that identifies school, child, family and community strengths and seeks to build on these" (p. 25).

Children do not have the ability to be inherently ready for the school environment (NAEYC, 2009). Young children are notably influenced by relationships and interactions with their families and connections within their immediate world (NAEYC, 2009). Although per child funding has decreased, "there was a strong trend toward improvement in developing and implementing early learning standards and moderate improvement in developing program quality standards generally" (NIEER, 2013, p. 19). School readiness opportunities require accessibility to a variety of resources, high-quality educational programs, and applicable interventions in order to provide support for families and children (NAEYC, 2009).

Children with disabilities or delays often lack school readiness skills (Nave et al., 2009). In the Oregon study, Nave et al. (2009) documented most often school readiness skills below expectancy levels were related to literacy and math. Students identified with developmental delays or communication impairments "accounted for approximately 90 percent of disabilities in both early intervention and early childhood special education populations" (p. ii). Early intervention students with developmental delays were below skill expectancy levels by scoring approximately 81% on the foundation skill areas (Nave et al., 2009).

Over 50% of Hispanic children less than 5 years old, live in California, Florida, or Texas (NIEER, 2013). In addition, NIEER (2013) reported "all 3 states programs meet fewer than half of the quality standards benchmarks, and in key respects their standards are abysmal" (p. 16). In the Oregon study, Nave et al. (2009) found similar skills for White and Hispanic students receiving early intervention in all foundation areas. However, Hispanic children receiving special education services scored below age expectancies on approximately 88% of the foundation areas (Nave et al., 2009). In the Nave et al. (2009) research, "percentages of children in early intervention and early childhood special education services who were assessed as functioning below age-expected skill levels in each early childhood foundation area were generally consistent across race/ethnicity" (p. iii).

The chronological age of a child can impact school readiness skills. Grissmer, Aiyer, Murrah, Grimm, and Steele (2010) indicated:

> The significance of age as a predictor of scores declines from kindergarten entrance to fifth grade and disappears completely when developmental skills are incorporated into the equations. The complete elimination of age effects at fifth grade when developmental skills were incorporated may indicate that no other developmental skills at kindergarten entrance were missing when predicting later achievement. (p. 1015)

Throughout the nation, state models of early childhood and readiness skills vary. The skill requirements and criteria are generally measured by principles or standards. The Maryland Model for School Readiness (MMSR) includes seven learning domains (Maryland Department of Education [DOE], 2011). The Language and Literacy domain includes talking, listening, knowing some letters, while the Mathematical Thinking

domain includes counting, sorting, knowing some numbers and shapes (Maryland DOE, 2011). The Physical Development domain includes running, drawing, and using scissors, while the Scientific Thinking domain includes exploring, questioning, using the five senses (Maryland DOE, 2011). The Social and Personal Development domain includes getting along and following routines (Maryland DOE, 2011). The Social Studies domain includes learning about people, and the Arts domain includes singing and painting. (Maryland DOE, 2011)

There are 16 key foundational areas aligned with the Oregon K-12 standards to determine school readiness (Nave et al., 2009). The 16 key foundational areas for early childhood indicators are then divided into eight domains similar to the MMSR model. The Oregon DOE (2008) domains include:

1. Approaches to Learning: initiative and curiosity; engagement and persistence; and reasoning and problem solving.
2. Language and Literacy: listening and understanding; speaking and communicating; phonological awareness; book knowledge and comprehension; print awareness and alphabet knowledge, and early writing.
3. Math: numbers and operations; geometry and spatial sense; and patterns and measurement.
4. Physical Education and Health: fine (small) motor; gross (large) motor; and health status and practices.
5. Science: matter or the physical world; force, movement, and energy; forming the questions and hypothesis and designing an investigation; collecting and

presenting data and analyzing and interpreting results; organisms and heredity; and diversity and interdependence and dynamic earth.

6. Social Emotional Development: self-concept; self-control; cooperation; social relationships; and knowledge of families and communities.
7. Social Science Foundation: history; geography, environment, and surroundings; economics and economics concepts; civics and government rules; family roles and relationships; and government diversity.
8. The Arts: music; visual arts; movement; and dramatic play. (p. 3)

Similar to the Maryland and Oregon models, the Missouri model encompasses guiding principles and domains or standards (MODESE, 2009). The Missouri model domains include:

1. Literacy: symbolic development; speaking/expressive language; listening/receptive language; reading; and writing.
2. Math: number and operations; geometry and spatial sense; patterns and relationships (algebra); measurement; and exploring data (probability).
3. Physical Development, Health, and Safety: physical development; health; and safety.
4. Science: physical science; life science; and earth and space.
5. Social and Emotional Development: knowledge of self; and knowledge of others.
6. Approaches to Learning: shows curiosity; takes initiative; exhibits creativity; shows confidence; displays persistence; and uses problem-solving skills. (p. 1)

The National Center for Research on Early Childhood Education [NCRECE], (2010) examined predictors for school readiness and success. The predictors included possessing a general knowledge and understanding, early math skills, attention to task, and fine motor skills (NCRECE, 2010). In addition to predictors, other components were necessary in the early learning environment to provide applicable opportunities for children.

A critical element was noted by Pianta et al. (2011), "Early care and education programs for young children require evidence about the best strategies for fostering and assessing learning and developmental gains" (p. 51). Influenced by early learning, Martin (2010) reported math and science success at age 15 when the student had attended Early Start. Students in the Early Start program were also more likely to view college as important to parents (Martin, 2010).

Furthermore, Ebbeck and Chan (2011) reported the importance of the teachers "to take on the role of critical reflectors in a world where change is always taking place" (p. 462). Early childhood teaching practices that have been successful in the past does not indicate the need to continue those practices (Ebbeck & Chan, 2011). The early childhood practices and supports from teachers "should address the children's needs and diversity, giving them the rights that they deserve, as they continue to construct their identify" (Ebbeck & Chan, 2011, p. 462). Furthermore, Rushton (2011) stated there is a significant impact educators have on the early learning brain development as "literally have the ability to help shape a child's mind" (p. 94).

Funding

Funding is a critical component in the development and growth of high-quality early learning programs for young children (Organization for Economic Co-operation and Development [OECD], 2013). Continuous funding in the education of young children "helps to recruit professional staff who are qualified to support children's cognitive, social, and emotional development" (OECD, 2013, p. 283). Furthermore, the OECD (2013) stated, "Since early childhood education helps to build a strong foundation for lifelong learning and ensure equity in education later on, some countries have made access to pre-primary education almost universal for children by the time they are three" (p. 283).

Federal level. A concern was noted by the NAEYC (2012), "One of the most notable trends was the reduction of state funds for prekindergarten programs. Although some states were able to maintain their funding…19 out of 40 states with pre-K programs reduced their per-child funding" (p. 1). Oregon legislation, through the State Bill 909, established a council to have a plan in place by the end of the fiscal year of 2012 (NAEYC, 2012a). The mandatory components of the Oregon plan (NAEYC, 2012a) included:

- Ensuring that early intervention of children and families who are susceptible to certain risk factors based upon identified, critical indicators.
- Establishing and maintaining family support managers.
- Coordinating the support services provided to children and families.

- Ensuring that contracts with early childhood services and providers require measured progress, establish goals, and provide payment based on the success of the provider in achieving these goals.
- Establishing kindergarten readiness assessments and early learning benchmarks.
- Collecting and evaluating data related to early childhood services to ensure that stated goals are being achieved. (p. 3)

For early education funding at the federal level, President Obama (USDOE, 2013a) proposed "to help close America's school readiness gap and ensure that America's children enter kindergarten ready to succeed" (p. 1). Obama's (USDOE, 2013a) plan included:

1. Providing high-quality preschool for all. President Obama's Preschool for All proposal would provide every four-year-old child with access to high-quality preschool, while also incentivizing States to adopt full-day kindergarten policies. Providing a year of free, public preschool for every child is an important investment in our nation's future, providing our children the best start in life while helping hard-working families save thousands each year in costs associated with early care and education. This proposal would invest $75 billion over 10 years. Under the President's proposal, Missouri is estimated to receive $48,300,000 in the first year it participates in the Preschool for All program. This funding, combined with an initial estimated state match of $4,800,000, would serve about 5,897 children from low-and moderate-income families in the first year of the

program alone.

2. Investing in High-Quality Infant and Toddler Care. In order to increase high-quality early learning opportunities in the years before preschool, a new $1.4 billion competitive Early Head Start-Child Care Partnership grant program would support communities that expand the availability of early learning opportunities with child care providers that meet high Early Head Start quality standards, growing the supply of high-quality child care for children from birth through age 3. About 19,443 children in Missouri from birth to age three are currently served by the Child Care and Development Block Grant. (p. 1)

State level. The total 2012 state pre-kindergarten budget was $11,004,934 (Barnett et al., 2012). In the 2012 Missouri Early Education Profile (Barnett et al., 2012), state spending per child was $2,682, down from $3,051 in 2010. Federal Head Start spending per child was at $8,583 in 2010 and decreased to $7,229 in 2012 (Barnett et al., 2012). The special education enrollment was 9,144 students, while the Head Start enrollment was 14,603 students in 2012 (Barnett et al., 2012). The number of students in the ABC district-sponsored pre-school enrollment, the participating district in this research study, was 803 in 2012 (MODESE, 2012).

The monies for funding have decreased; nevertheless, the costs of education and resources have increased (Barnett et al., 2012). Chase, Coffee-Borden, Anton, Moore, and Valorose (2008) analyzed the cost burden to Minnesota of students not being prepared to enter kindergarten was approximately $113 million dollars annually. The costs included:

1. $42 million (37%) is the net loss of per pupil aid to school districts as a result of students dropping out before graduation.
2. About $28.9 million (26%) are the estimated teacher-related costs due to absenteeism, turnover, and extra pay to compensate teachers for unsatisfactory working conditions because of behavior problems and low achievement among students that could have been prevented if the students were better prepared for school success.
3. About $24.4 million (22%) is the estimated portion of the actual special education and grade repetition costs that can be attributed to children entering kindergarten not fully prepared.
4. $11 million (10%) is the estimated cost of serving English language learners with no early education.
5. About $6 million (5%) is spending on school safety due to delinquent behavior in the schools that possibly could have been prevented if the students were better prepared for school success. (p. 1)

Opposing Educational Aspect

According to the research by Peterson et al. (2011), students and parents often accuse the teachers for lack of individual achievement. When a student is not displaying academic growth, the teacher often criticizes the student and parents (Peterson et al., 2011). When related to the amount of special education services, the National Center for Special Education Research (2009) stated, “Young children who received special education services for three years had more problem behaviors than children who

received services for only 1 or 2 years; however, this difference was statistically significant for males only" (p. 53).

Summary

Through legislation and funding, opportunities for students with educational disabilities have increased over time (USDOE, 2012a). Prior to 1975, many students with disabilities were excluded from accessing educational settings (USDOE, 2012a). Initially, the Education for All Handicapped Children Act of 1975(EAHCA), or Public Law 94-142, was passed which provided educational opportunities for children ages six to eighteen (EAHCA, 1975). The amended EAHCA amended increased support of students with disabilities for students from birth up to 21-years of age and accessibility for families for early interventions (National Dissemination of Center for Children with Disabilities, 2011). Additional amendments to EAHCA were made in 1990, 1997, and 2004 (USDOE, 2012a) which provided additional emphasis on early childhood development and education.

The No Child Left Behind Act of 2001 was a reauthorization of the Elementary and Secondary Education Act passed in January 2002 (NCLB, 2002). The focus was to create a transparency of accountability, teacher qualifications, and progress of all students (NCLB, 2002). The goal was for all students to be proficient and advanced in grades 3 through 8, 10, and 11 by 2014. However, waivers are available to states instead of relying on one end-of-year assessment (Duncan, 2013).

High-quality preschool requires the involvement of many stakeholders as well as funding. President Obama proposed billions of dollars to support high-quality infant and toddler care (USDOE, 2013a). Family participation and collaboration are essential

components in meeting the needs of children (USDOE, 2013a). The supportive systems provided by the early childhood teams for young children and families are necessary to connect the gap for children at-risk (Peterson et al., 2010).

Early learning experiences throughout the first few years of life "give children a head start on skill development, school readiness, and future educational success" (The World Bank Group, 2012, para. 1). Children may attend kindergarten without the academic and social skills needed for the school setting and at-risk students are at a greater detriment (Cannon & Lipscomb, 2011). Early interventions and special education services can provide opportunities for the academic, social skills, and educational development of young children (U.S. Department of Treasury, 2006). However, many negative aspects of a young child's life can cause deficits in the developmental learning process (Geoffroy et al., 2010). Lack of high-quality childcare or preschool, mother's educational level, and poverty are factors that can negatively impact the learning process (Pianta et al., 2011).

Results of the Chien et al. (2010) study found an increase in academic growth for students as an outcome of increase instruction time, and effective early interventions resulted in increased academic growth for students when those services intensive, structured, and systematic. Research conducted by Pianta et al. (2011) resulted in smaller achievement gains due to the lack of high-quality educational services. The significant impact on a child's success is relative to the cost of high-quality educational services (Pianta et al., 2011).

Child development is a complex process with potentially lifelong consequences. Children are engaged members of their learning processes (McLeod, 2012; 2013). The

brain develops rapidly up to age five. In addition, the social and cultural characteristics can influence the developmental skills of a child (McLeod, 2013). However, behavior issues can impede early learning growth and development (Bulotsky-Shearer, Fernandez, Dominquez, & Valorose, 2011). Ebbeck and Chan (2011) stated guidelines and curricula should be child centered in the development of their individualities.

Early education standards and guidelines vary from state to state. In Missouri, the early learning guiding principles (MODESE, 2011b) were established in order to meet the needs early childhood students. High-quality learning opportunities, significance of the parent role, and funding are key components of the guiding principles (MODESE, 2011b). Missouri would receive about $8.3 million dollars to assist educators and family support systems in collaborative roles to meet the needs of all young children (USDOE, 2013a).

The PAT program was piloted in Missouri in 1981 with statewide implementation in 1985 (PAT National Center, 2013a). The mission of PAT is to help parents so "children develop optimally during the crucial early years of life" (PAT National Center, 2013b, para. 2). The PAT program utilizes evidence-based research to educate staff and providers ((PAT National Center, 2012). All 50 states have implemented this program (PAT National Center, 2013a).

Readiness skills include more than just the individual child (Docket & Perry, 2009). School readiness encompasses the characteristics and expectations of all of the stakeholders in the community, including the child (Docket & Perry, 2009). The influences of families and communities impact the child's relationships and interactions within their immediate world (NAEYC, 2009). School readiness opportunities require

accessibility to a variety of resources, high-quality educational programs, and applicable interventions in order to provide support for families and children (NAEYC, 2009). School readiness skills are often lacking for students with delays or disabilities (Nave et al., 2009).

In Chapter Three, the focus was the methodology of the research. The population and sample size criteria were discussed in detail. The research approach to collecting and analyzing the data was documented. The secondary data gathered and analyzed included student scores from 2008 to 2012 to determine if there was a significant difference between ECSE and non-ECSE achievement levels at the second and third grade.

In Chapter Four, a review of the study design and analysis of the quantitative secondary data were presented. The TerraNova assessment scores from the end of second grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference of academic achievement scores for students with early interventions compared to students without early interventions. The Performance Series assessments scores from the end of third grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference of academic achievement scores for students with early interventions compared to students without early interventions in the primary school years.

In Chapter Five, a summary of the study was presented. The findings of this study were revealed to determine whether there was a significant difference between the means of students who received ECSE services and similar peers without ECSE services as measured by the TerraNova at second grade and the Performance Series at third grade.

Conclusions, implications for practice, and recommendations for future research were discussed.

Chapter Three: Methodology

A child's experiences throughout the first few years of life impact a child's readiness to enter kindergarten. During this significant stage of growth and development, Ehrlich (n.d.) acknowledged, "Experts tell us 90% of all brain development occurs by the age of five. If we don't begin thinking about education in the early years, our children are at risk of falling behind by the time they start kindergarten" (para. 6). Effective early learning intervention programs focus specifically on meeting the developmental needs of young children (NAEYC, 2012a). Furthermore, the NEA (2013) supported "providing a high-quality early childhood education and health services, students enter kindergarten ready to learn and allow the schools to focus on accelerating achievement rather than remediation" (p. 1).

Problem and Purpose Overview

Children are not always academically and socially prepared going into kindergarten. In 2012, the special education enrollment statewide was 9,144 students, while the Head Start enrollment was 14,603 students in 2012 (Barnett et al., 2012). The number of students in the ABC school district-sponsored pre-school enrollment was 803 in 2012 (MODESE, 2012). However, the number of young children less than five years of age in Missouri was approximately 370,000 in the 2000 Census (U.S. Census Center, 2010). Furthermore, the U.S. Census Center (2010) noted, "It is estimated that approximately 10% of those children will require special education and an additional 15% will require less intense services, such as remedial or Title I services during their school years" (p.1). Risks for children not prepared for school entry include, "inadequate school readiness has been associated with poverty and poor health, a lack of reading

materials and cognitive stimulation in the home, and cultural variation in beliefs and attitudes about education" (South Carolina Solutions, 2012, p. 1).

The purpose of this study was to determine if there was a significant difference between the academic achievement of students participating in ECSE compared to students without ECSE services with low DIAL-3 scores ranked in the 20th percentile or less. The purpose was to demonstrate if there was a significant difference of early interventions programs, such as ECSE services, in preparation for school achievement as measured by the TerraNova at the second grade level and Performance Series at the third grade level compared to students with DIAL-3 scores ranked in the 20th percentile or below who did not receive services.

Research Questions

The following research questions guided this study:

1. What is the difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

2. What is the difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

3. What is the difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

4. What is the difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

5. What is the difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

6. What is the difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

7. What is the difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

8. What is the difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

9. What is the difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

Null Hypotheses

The null hypotheses were rejected if the alpha level was equal to or less than .05.

$H1_o$ There is no difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H2_o$ There is no difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

$H3_o$ There is no difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H4$_o$ There is no difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H5$_o$ There is no difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H6$_o$ There is no difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H7$_o$ There is no difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H8$_o$ There is no difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H9$_o$ There is no difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

Research Design

A stratified sampling was utilized within two groups of students' assessment scores. The students within the ECSE and non-ECSE groups were randomly selected (Bluman, 2009). The first strata consisted of assessment scores of 30 random students who received ECSE services. The second strata consisted of assessment scores of 30 random students with DIAL-3 scores ranked in the 20th percentile or below who did not receive ECSE services. The data range was from 2008 through 2012. For the purpose of the study, students at the 20th percentile or below were at an increased risk of developmental issues. The secondary data (TerraNova, Performance Series, ECSE, non-ECSE participation, and DIAL-3 scores) were collected and utilized for this study. The students' anonymity was protected by assigning numbers in place of students' names.

Population and Sample

The sample was selected from the population of students in one district. Specifically, the sample was comprised of 30 random students who had received ECSE services prior to entering kindergarten and 30 random students with DIAL-3 scores ranked to the 20th percentile and no previous ECSE services in an accredited school district from 2008 to 2012. The ABC school district's total school population was approximately 24,000 at the time of this study.

The total number of students eligible in 2011 for free or reduced price meals (see Figure 1) for the district was 50.5%, which was approximately 3% higher than the state average (MODESE, 2013a). The free or reduced price meals percentage for the district increased in 2012 to 52.9% (MODESE, 2013a). The state average was 49.5% for 2012 (MODESE, 2013a).

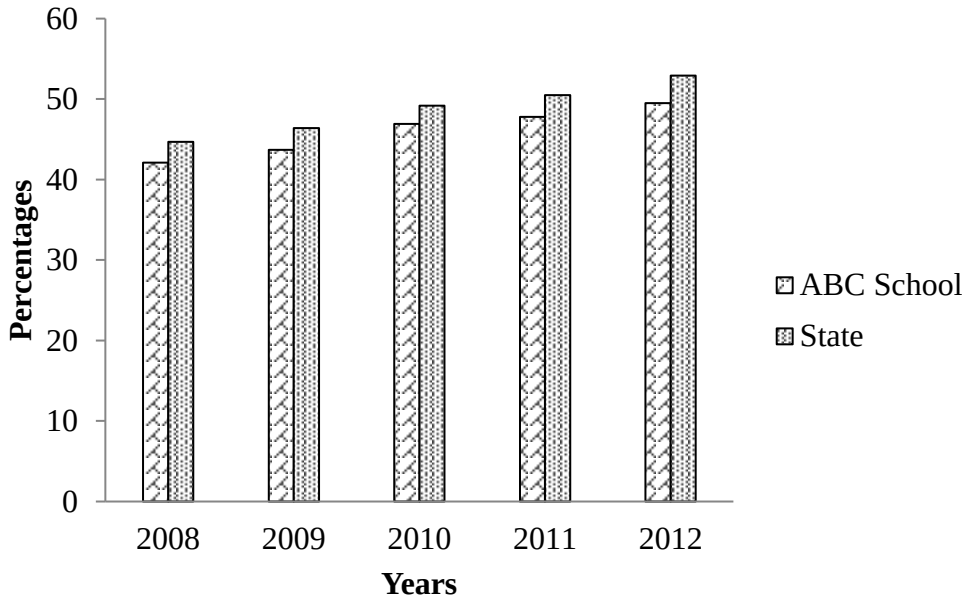

Figure 1. Free or reduced price meals.

The number of students from ECSE to kindergarten from 2004 through 2011 is presented in Table 1. The students transitioning from ECSE to kindergarten vary year to year. In 2006, 135 students transitioned from the ECSE setting to kindergarten. In 2009, 290 students transitioned from the ECSE setting to kindergarten. The average number of students transitioning yearly was about 203 students.

Table 1

ECSE to Kindergarten Transition Students

Year	2004	2005	2006	2007	2008	2009	2010	2011
Students	151	151	135	178	190	290	250	278

Preschool enrollments (see Figure 2) across the state vary (MODESE, 2013a). In 2012, the ABC school had 19 more preschool children than Columbia Schools (MODESE, 2013a). St. Louis City had the most significant increases with more than 2,100 children enrolled in preschools in 2012 (MODESE, 2013a). While other districts increased in preschool enrollments, Rockwood had a decline in preschool enrollments (MODESE, 2013a).

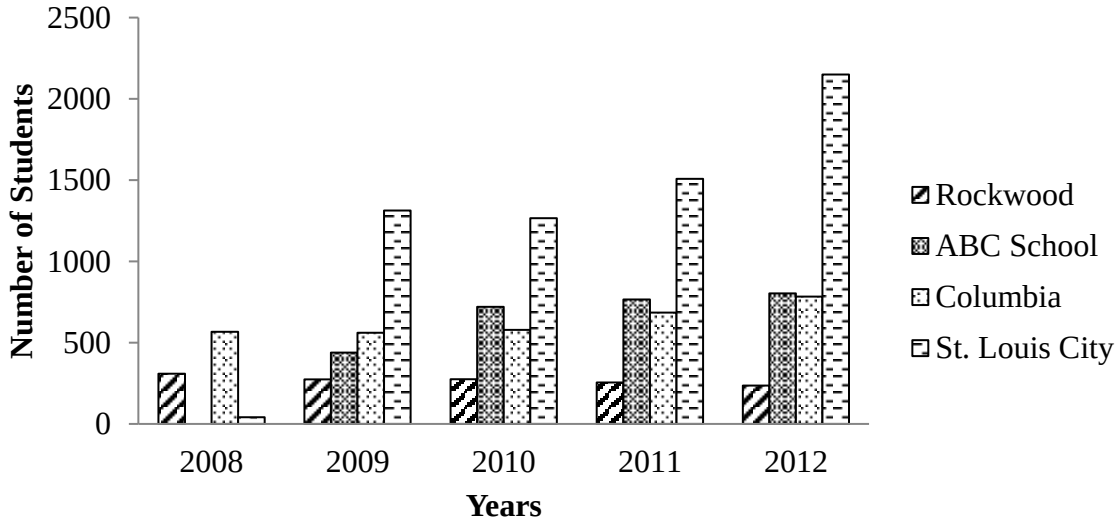

Figure 2. Preschool enrollments for academic years 2008-2012.

In the 2010 Census, family income varied considerably throughout the ABC County (U.S. Census Center, 2010). Some ABC County households had fixed incomes, some received public assistance payments and/or disability, and some households had two-income parents (U.S. Census Center, 2010). The family type varied for one parent, two parents, and guardian situations with more than 45.3% being from a two parent family setting in ABC County (U.S. Census Center, 2010).

In the 2010 Missouri Census, the average annual wage/salary for ABC County was $35,405, which was approximately a $3,000 increase from the previous three years (U.S. Census Center, 2010). Adult unemployment in ABC County was 8.3%, which almost doubled in three years (U.S. Census Center, 2010). The work force by occupation in ABC County was management, professional, and related occupations (32.2 %); service (18.3%); sales/office (29.1%); natural resources, construction, and maintenance (8.3 %); and production, transportation and material moving (12.1%) (U.S. Census Center, 2010).

Throughout ABC County in 2009, improvements included a decrease in infant mortality rate, child deaths, mothers without high school diplomas, high school dropout rates, births to teens, violent deaths, and out-of-home placements (Missouri Kids Count, 2010). Child abuse and neglect cases in ABC County had decreased but continued to be more than twice the amount of the State level (64.5 versus 29.8 per 1,000) (Missouri Kids Count, 2010). There was an increase in the number of students who qualified for free and reduced price school meals in ABC County (Missouri Kids Count, 2010).

As of 2009, children ages 0 to 6 living in poverty were 26.6%, which was an increase of 4% from 2007 in ABC County (Missouri Kids Count, 2010). Children living in single parent homes were at 33.4% in 2009, which was 1.2% more than the state

average (Missouri Kids Count, 2010). The number of minority children has increased from 10.7% to 11.6% from 2005 to 2009 (Missouri Kids Count, 2010). Throughout ABC County, there were 503 children with limited English proficiency compared to 223 in 2005 (Missouri Kids Count, 2010). Parents paying their child support payments in the state system have increased to 61.6% in ABC County (Missouri Kids Count, 2010). Children receiving cash assistance has consistently stayed under 5% (Missouri Kids Count, 2010).

The number of children receiving food stamps and enrolled in MC+/Medicaid has risen from 31.5% in 2006 to 37.9% in 2009 (Missouri Kids Count, 2010). The Missouri Census Data (U.S. Census Center, 2010) indicated ABC County family households were 60.7% (68,592). The percentage for female single householders with children under the age of 18 was lower at 6.4% compared to male single householders with children was at 2.4% in ABC County (U.S. Census Center, 2010). The poverty level throughout ABC County has increased significantly for single mothers with children under the age of 5 to 66% (U.S. Census Center, 2010). Although, the specific demographic details of the ECSE and non-ECSE students were unknown, the students should be representative of the demographics due to the random sampling procedures utilized.

Instrumentation

The instrumentation consisted of the Performance Series assessments, TerraNova, and DIAL-3 scores. The Performance Series assessments are required by the district three times for third grade students in the areas of language arts, reading, and math. However, for the purpose of this study, the assessment scores for the end of the year achievement scores were utilized. The TerraNova, Third Edition, is a complete diagnostic assessment

given at the second grade level. The DIAL-3 is a screening instrument used in the referral process to ECSE and/or prior to kindergarten. Three subtests (motor, concepts, and language) required direct observation of a child's performance on various skill items. For the purpose of the study, the 20th percentile was utilized to document an increased risk of developmental issues.

The Performance Series is an online, computer-adaptive test which is criterion-referenced and norm-referenced. Results from the assessments provided feedback to the grade-specific objective level by student. The Performance Series assessments were required by the district at the beginning, middle, and end of the year in grades three through eight in the areas of language arts, reading, and mathematics (EDmin, Inc., 2012). For the purpose of this study, the end of the year assessment scores were utilized.

The TerraNova is a complete diagnostic assessment. Diagnostic information includes norm-referenced achievement scores, criterion-referenced mastery scores, and performance-level data. The TerraNova is used in the school district to measure second grade achievement levels in reading and mathematics. The assessment is given generally in the eighth month of the second grade year (McGraw-Hill, 2012).

The DIAL-3 is designed to be individually administered. It is a screening instrument used in the referral process to ECSE and/or prior to kindergarten. Three subtests (motor, concepts, and language) require direct observation of a child's performance on various skill items. Parents rate their child on self-help and social development skills. The DIAL-3 is standardized based on data from a stratified sample of children ages 3 years 0 months to 6 years 11 months, and the standardized sample includes children receiving special services (Pearson Assessments, 2012).

Data Collection

Prior to the research, the Lindenwood Institutional Review Board approved this study (see Appendix A). Then, approval was received from the ABC school district prior to the data collection (see Appendix B). In this study, 2008 through 2012 secondary data (ECSE and non-ECSE student scores from the DIAL-3, TerraNova, and Performance Series scaled scores) were analyzed in order to answer the guiding research questions. The DIAL-3 total percentiles and ECSE and non-ECSE data were provided by the Parents as Teachers Director. The DIAL-3, 2011 TerraNova, and 2012 Performance Series assessment scores were collected, organized, and entered into an Excel spreadsheet into an ECSE group and non-ECSE group of students. The names of the students were changed to numbers and then randomly selected to equal groups of 30. Although, the general demographics have been identified in Chapter Three, specific demographic details are limited by the characteristics of the local population. The students were considered to be representative of the demographics due to the random sampling procedures utilized.

The secondary data included the assessment scores of random 30 students in the third grade with previous ECSE services and random 30 students in third grade without ECSE services and low (20^{th} percentile or below) DIAL-3 scores. The ECSE students' second grade achievement scores, as measured by the TerraNova, were compared to the non-ECSE students with low DIAL-3 scores. Then, the ECSE students' third grade achievement scores, as measured by the Performance Series, were compared to the non-ECSE students with low DIAL-3 scores.

Data Analysis

This causal-comparative study utilized multiple *t*-tests to determine whether there was a significant difference between the means of students who received ECSE services prior to entering kindergarten in comparison to similar peers without ECSE services as measured by the TerraNova at second grade and the Performance Series at third grade (Bluman, 2009; Fraenkel & Wallen, 2009). The ECSE students' second achievement scores were compared to the non-ECSE students' achievement scores. The ECSE students' third grade achievement scores were compared to the non-ECSE students' achievement scores.

The scaled scores for the TerraNova and Performance Series were utilized to answer the research questions. The Performance Series assessments are given three times throughout the school year. However, for the purpose of this study and to remain consistent with the TerraNova assessment window, the end-of-year Performance Series assessment scores were utilized. The *p* value equal to or less than .05 indicated a customary level of significance (Creative Research Systems, 2012) for the purpose of this study.

Summary

Students are not always prepared with the tools needed to enter kindergarten (Cannon & Lipscomb, 2011). A child's experiences throughout the first few years of life help develop school readiness skills upon entering the kindergarten setting. Students with special needs often enter kindergarten lacking or delayed in the needed skills to be successful learners (Cannon & Lipscomb, 2011). With lack of readiness skills upon

school entry, the district and community have a burden of additional expenses for interventions and retention (USDOE, 2012c).

The purpose of this study was to determine if there was a difference between the academic achievement of students participating in ECSE compared to non-ECSE students. The achievement scores of 30 ECSE students and 30 non-ECSE students were randomly selected for a total of 60 students. The research questions and null hypotheses were created to guide this study and answer questions related to the early intervention supports of ECSE compared to students with no ECSE support system but with significantly low pre-entry scores as measured by the DIAL-3 assessments.

The research design included a stratified random sampling of ECSE and non-ECSE students' scores (Bluman, 2009). The first strata included assessment scores of 30 ECSE students. The second strata included assessment scores of 30 non-ECSE students with low DIAL-3 scores. Assessment scores from 2008 through 2012 were collected for the ECSE and non-ECSE students. Students with DIAL-3 scores in the 20th percentile or below were considered at-risk of developmental issues. The students' anonymity was protected by assigning numbers in place of students' names.

The district has a free or reduced price meal percentage of 50.5% which is greater than the state average (MODESE, 2013a). Over 50% of households are not from a two parent setting (U.S. Census Center, 2010). According to the 2010 Census, the average income of $35,405 is in the poverty level (U.S. Census Center, 2010). The number of children in homes receiving state assistance for food stamps and Medicaid is approximately 38% (Missouri Kids Count, 2010).

Specific demographic details of the ECSE and non-ECSE students are unknown; the students are representative of the demographics due to the random sampling procedures utilized. The average number of students transitioning from the ECSE setting to kindergarten, including itinerant services, is 203 students per year. In 2012, approximately 800 students were enrolled preschools in ABC school district.

This causal-comparative study utilized multiple *t*-tests to determine whether there was a significant difference between the means of students' scores who received ECSE services and non-ECSE students without services but with low DIAL-3 scores as measured by the TerraNova at second grade and the Performance Series at third grade (Bluman, 2009; Fraenkel & Wallen, 2009). The scaled scores for the TerraNova and Performance Series were utilized to answer the research questions. In addition, the standard items pool scores were also utilized to answer the research questions. To remain consistent with the TerraNova assessment window, the end-of-year Performance Series assessment scores were utilized although assessments are given three times a year.

In Chapter Four, a review of the study design and analysis of the quantitative secondary data were presented. The TerraNova assessment scores from the end of second grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference in academic achievement scores for students with early interventions compared to students without early interventions. The Performance Series assessments scores from the end of third grade were compared between the ECSE and non-ECSE students to determine if there was a significant difference in academic achievement scores for students with early interventions compared to students without early interventions in the primary school years.

In Chapter Five, a summary of the study was presented, and the findings of this study were revealed. The research questions and hypotheses were addressed. Conclusions, implications for practice, and recommendations for future research were discussed.

Chapter Four: Presentation of Data

The expectation of skills and competencies young children bring to school is based on early childhood development and how they learn (NAEYC, 2009). A child's developmental abilities and skill acquisition are not always aligned to a child's chronological age (NAEYC, 2009). Effective early intervention programs provide children with learning opportunities to meet their developmental needs (NAEYC, 2012b). Early intervention and early childhood special education have emerged as the main source of family support and education for children under five years of age with disabilities (NIEER, 2013).

The monies for funding have decreased; nevertheless, the costs of education and resources have increased (Barnett et al., 2012). In 2012, the total state pre-kindergarten budget was $11,004,934 (Barnett et al., 2012). In the 2012 Missouri Early Education Profile (Barnett et al., 2012), state spending per child was $2,682, down from $3,051 in 2010. Federal Head Start spending per child was $8,583 in 2010 and has decreased to $7,229 (Barnett et al., 2012). The special education enrollment was 9,144 students, while the Head Start enrollment was 14,603 students in 2012 (Barnett et al., 2012). The number of students in the ABC district-sponsored pre-school enrollment was 803 in 2012 (MODESE, 2012).

Study Design

This causal-comparative study utilized multiple *t*-tests to determine whether there was a significant difference between the means of students who received ECSE services and non-ECSE peers as measured by the TerraNova at second grade and the Performance Series at third grade. The groups were 30 ECSE students and 30 non-ECSE students with

low (20th percentile or below) DIAL-3 scores. Academic achievement scores of the ECSE students were compared to scores of non-ECSE students at the end of second and third grade. A probability, or *p* value, of equal to or less than .05 indicated a level of statistical significance (Creative Research Systems, 2012).

Research Questions

The following research questions guided this study:

1. What is the difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

2. What is the difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

3. What is the difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

4. What is the difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

5. What is the difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

6. What is the difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

7. What is the difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

8. What is the difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

9. What is the difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

Null Hypotheses

The null hypotheses were rejected if the alpha level was equal to or less than .05.

H1$_o$ There is no difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H2$_o$ There is no difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H3$_o$ There is no difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H4$_o$ There is no difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H5$_o$ There is no difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H6$_o$ There is no difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H7$_o$ There is no difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H8$_o$ There is no difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

H9$_o$ There is no difference between third grade math achievement standard item scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

Analysis of Quantitative Data

Second grade TerraNova data were collected through the district's database for ECSE and non-ECSE students. Third grade Performance Series data were collected through the district's database for ECSE and non-ECSE students. The TerraNova scaled scores on the overall, reading, and math were compared to the ECSE and non-ECSE students to determine if there was a significant difference. The TerraNova was given at the end of the 2011 second grade school year.

On the third grade Performance Series assessments, the following scores were analyzed in reading: scaled score, national percentile, grade level equivalency, standard item pool, lexile level, grade level equivalency, and national curve equivalency; language arts: scaled score, national percentile, standard item pool, grade level equivalency, and national curve equivalency; and math: scaled score, national percentile, standard item pool, grade level equivalency, and national curve equivalency. For the purpose of this study, only the scaled scores and standard item pool scores were utilized in answering the research questions. The Performance Series assessments were given three times throughout the school year (beginning, middle, and end of year). However, the 2012 end-of-year third grade assessment scores were analyzed to remain consistent with the second grade TerraNova assessment window.

The mean for ECSE students was 585 compared to the mean of 565 for the non-ECSE students. The mean for the ECSE students was 587 compared to the mean of 562 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 2. The mean for the ECSE students exceeded the mean of the non-ECSE students on the overall scaled score.

Table 2

2011 Second Grade Central Tendency Data for TerraNova Overall Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	585	587	40
Non-ECSE	565	562	32

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the TerraNova overall scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 3). The ECSE students (M = 585, SD = 40) demonstrated significantly higher levels of academic achievement on the TerraNova overall scaled scores than the non-ECSE students (M = 565, SD = 32), $t(29) = 2.07$, $p = .043$, two-tailed.

Table 3

2011 Second Grade TerraNova Overall Scores

Overall Subtest Area	ECSE	Non-ECSE	*p*
Scaled Score	585	565	.043*
National Percentile	50	34	.031*
National Curve Equivalency	48	39	.078
Grade Level Equivalency	2.9	2.3	.066

The ECSE students had a national percentile mean of 50 and a standard deviation of 30 compared to the non-ECSE students with a mean of 34 and a standard deviation of 24 (see Figure 3). The ECSE students had a national curve equivalency mean of 48 and a standard deviation of 23 compared to the non-ECSE students with a mean of 38.8 and a standard deviation of 18. The ECSE students' national percentiles mean exceeded the non-ECSE students' mean by 16. The ECSE students' national curve equivalencies mean exceeded the non-ECSE students' mean by 9.

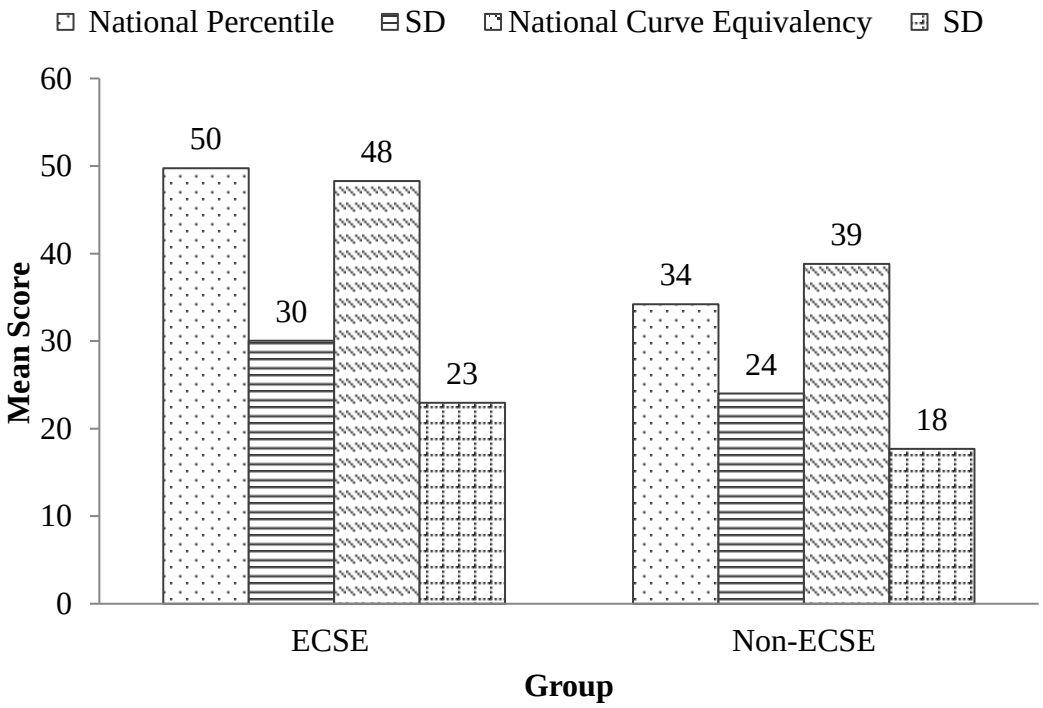

Figure 3. TerraNova overall national percentiles and curve equivalencies.

The mean for ECSE students was 597 compared to the mean of 578 for the non-ECSE students. The median for the ECSE students was 603 compared to the median of 582 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 4. The mean for the ECSE students exceeded the mean of the non-ECSE students on the reading scaled score.

Table 4

2011 Second Grade Central Tendency Data for TerraNova Reading Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	597	603	43
Non-ECSE	578	582	38

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the TerraNova reading scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 5). Although the means were higher for the ECSE students' scores (M = 597, SD = 43), the academic achievement scores were not statistically different on the TerraNova reading scaled scores compared to the non-ECSE students' scores (M = 578, SD = 38), $t(29) = 1.83$, $p = .072$, two-tailed.

Table 5

2011 Second Grade TerraNova Reading Scores

Reading Area	ECSE	Non-ECSE	*p*
Scaled Score	597	578	.072
Total Points Earned	39	34	.049*
Grade Level Equivalency	3.0	2.20	.090
Achievement Level Code	3.0	2.4	.059

The mean for ECSE students was 572 compared to the mean of 553 for the non-ECSE students. The median for the ECSE students was 576 compared to the median of 554 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 6. The mean for the ECSE students exceeded the mean of the non-ECSE students on the math scaled score.

Table 6

2011 Second Grade Central Tendency Data for TerraNova Math Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	572	576	47
Non-ECSE	553	554	32

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the TerraNova math scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 7). Although the means were higher for the ECSE students' scores (M = 572, SD = 47), the academic achievement scores were not statistically different on the TerraNova math scaled scores compared to the non-ECSE students' scores (M = 553, SD = 32), $t(29) = 1.85$, $p = .069$, two-tailed.

Table 7

2011 Second Grade TerraNova Math Scores

Math Area	ECSE	Non-ECSE	*p*
Scaled Score	572	553	.070
Total Points Earned	36	32	.079
Grade Level Equivalency	3.0	2.3	.066
Achievement Level Code	3.2	2.7	.057

The mean on the TerraNova overall grade level equivalency for the ECSE students was 2.9 and the standard deviation was 1.6 compared to non-ECSE students' mean of 2.3 and a standard deviation of 0.9 (see Figure 4). The mean for the TerraNova reading grade level equivalency for the ECSE students was 3.0 with a standard deviation of 1.7 compared to non-ECSE students' mean of 2.2 with a standard deviation of 1.5. The mean for the TerraNova math grade level equivalency for the ECSE students was 3.0 and a standard deviation of 1.8 compared to non-ECSE students' mean of 2.3 and a standard deviation of 0.8. The ECSE students' means were higher than the means of the non-ECSE students on the TerraNova assessment.

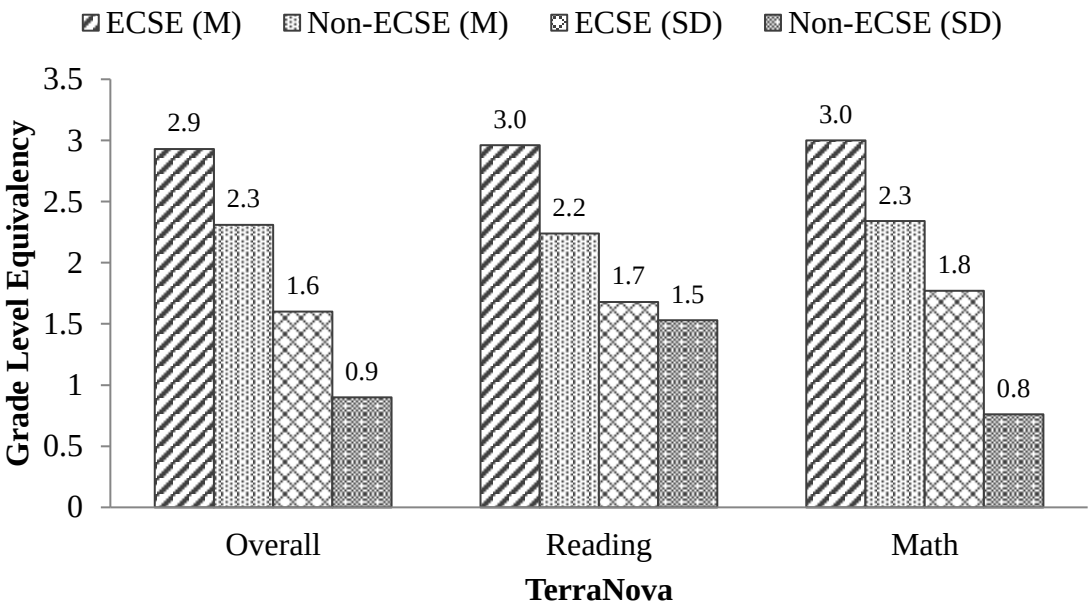

Figure 4. TerraNova grade level equivalencies.

The reading and math achievement level codes on the TerraNova was based on levels one through five (see Figure 5). In reading, the ECSE students had a mean of 3.0 and a standard deviation of 1.2 compared to the non-ECSE students with a mean of 2.4 and a standard deviation of 1.0. In math, the ECSE students had a mean of 3.2 and a standard deviation of 1.2 compared to the non-ECSE students with a mean of 2.7 and a standard deviation of 1.0.

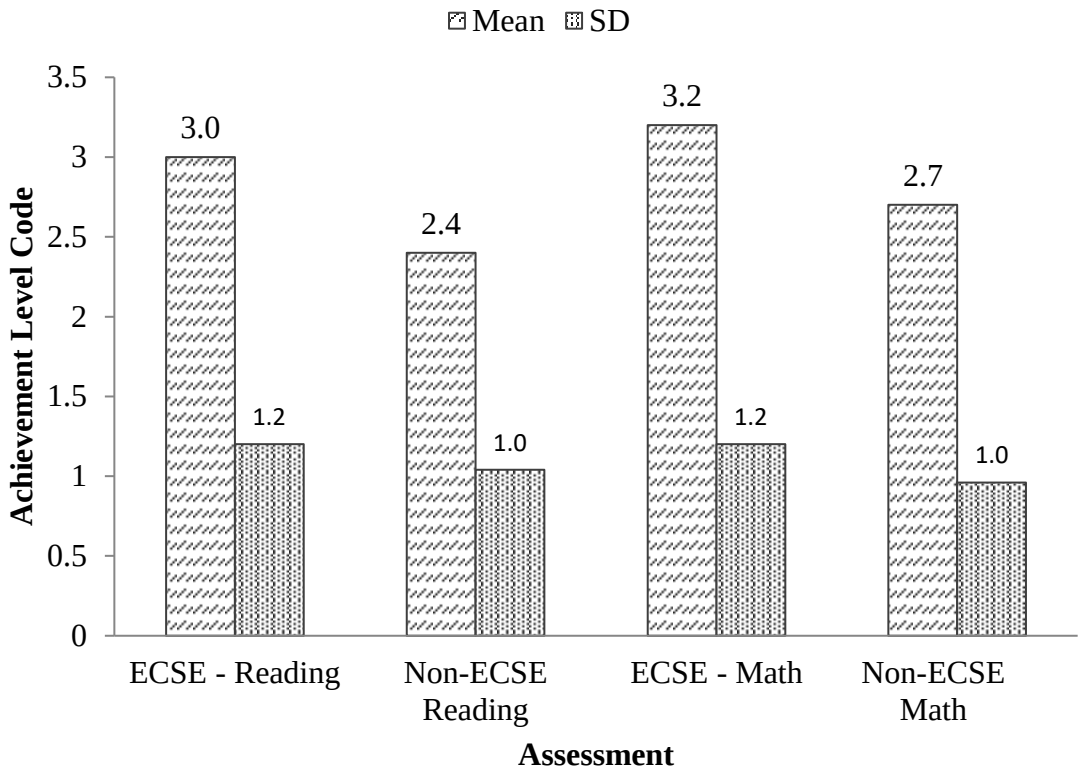

Figure 5. TerraNova achievement level codes.

The mean for ECSE students was 2417 compared to the mean of 2244 for the non-ECSE students. The median for the ECSE students was 2460 compared to the median of 2278 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 8. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series reading scaled score.

Table 8

2012 Third Grade Central Tendency Data for Performance Series Reading Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	2417	2460	249
Non-ECSE	2244	2278	276

Note. $n = 30$. [a]Based on sample.

The mean for ECSE students was 71 compared to the mean of 51 for the non-ECSE students. The median for the ECSE students was 78 compared to the median of 54 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 9. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series reading standard item pool scores.

Table 9

2012 Third Grade Central Tendency Data for Performance Series Reading Standard Item Pool Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	71	78	22
Non-ECSE	51	54	24

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the Performance Series reading scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 10). The ECSE students ($M = 2417$, $SD = 249$) demonstrated significantly higher levels of academic achievement on the Performance Series reading scaled scores than did the non-ECSE students ($M = 2244$, $SD = 276$), $t(29) = 2.54$, $p = .014$, two-tailed.

The academic achievement scores as measured by the Performance Series reading standard item pool scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores. The ECSE students (M = 71, SD = 22) demonstrated significantly higher levels of academic achievement on the Performance Series reading standard item pool scores than did the non-ECSE students (M = 51, SD = 24), $t(29) = 3.41$, $p = .001$, two-tailed.

Table 10

2012 Third Grade Performance Series in Reading

Reading Area	ECSE	Non-ECSE	*p*
Scaled Score	2417	2244	.014*
Standard Item Pool	71	55	.001**
National Percentile	46	30	.010**
Lexile Level	550	422	.015*
Grade Level Equivalency	4.3	3.5	.015*

The mean for ECSE students was 2353 compared to the mean of 2255 for the non-ECSE students. The median for the ECSE students was 2363 compared to the median of 2295 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 11. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series language arts scaled score.

Table 11

2012 Third Grade Central Tendency Data for Performance Series Language Arts Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	2353	2363	166
Non-ECSE	2255	2295	171

Note. $n = 30$. [a]Based on sample.

The mean for ECSE students was 59 compared to the mean of 49 for the non-ECSE students. The median for the ECSE students was 61 compared to the median of 53 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 12. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series language arts standard item pool.

Table 12

2012 Third Grade Central Tendency Data for Performance Series Language Arts Standard Item Pool Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	59	61	16.2
Non-ECSE	49	53	15.5

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the Performance Series language arts scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 13). The ECSE students (M = 2353, SD = 166) demonstrated significantly higher levels of academic achievement on the Performance Series language arts scaled scores than did the non-ECSE students (M = 2255, SD = 171), $t(29) = 2.26$, $p = .028$, two-tailed.

The academic achievement scores as measured by the Performance Series language arts standard item pool scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores. The ECSE students (M = 59, SD = 16.2) demonstrated significantly higher levels of academic achievement on the Performance Series language arts standard item pool scores than did the non-ECSE students (M = 49, SD = 15.5), $t(29) = 2.24$, $p = .029$, two-tailed.

Table 13

2012 Third Grade Performance Series in Language Arts

Language Arts Area	ECSE	Non-ECSE	*p*
Scaled Score	2353	2255	.028*
Standard Item Pool	59	49	.029*
National Percentile	44	29	.012*
Grade Level Equivalency	3.8	3.1	.015*

The mean for ECSE students was 2339 compared to the mean of 2260 for the non-ECSE students. The median for the ECSE students was 2381 compared to the median of 2282 for the non-ECSE students. The standard deviations for second grade students with and without ECSE services are shown in Table 14. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series math scaled score.

Table 14

2012 Third Grade Central Tendency Data for Performance Series Math Scaled Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	2339	2381	175
Non-ECSE	2260	2282	120

Note. $n = 30$. [a]Based on sample.

The mean for ECSE students was 73 compared to the mean of 67 for the non-ECSE students. The median for the ECSE students was 80 compared to the median of 73 for the non-ECSE students. The standard deviations for third grade students with and without ECSE services are shown in Table 15. The mean for the ECSE students exceeded the mean of the non-ECSE students on the Performance Series math standard item pool scores.

Table 15

2012 Third Grade Central Tendency Data for Performance Series Math Standard Item Pool Scores

Source	Mean	Median	[a]Standard Deviation
ECSE	73	80	18.6
Non-ECSE	67	73	19.2

Note. $n = 30$. [a]Based on sample.

The academic achievement scores as measured by the TerraNova math scaled scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores (see Table 16). The ECSE students (M = 2339, SD = 175) demonstrated significantly higher levels of academic achievement on the TerraNova math scaled scores than did the non-ECSE students (M = 2260, SD = 120), $t(29) = 2.04$, $p = .046$, two-tailed.

The academic achievement scores as measured by the TerraNova math standard item pool scores of ECSE students were compared to non-ECSE students with low DIAL-3 scores. The scores of the ECSE students (M = 73, SD = 18.6) were not statistically different on the TerraNova math standard item pool scores than non-ECSE students (M = 67, SD = 19.2), $t(29) = 1.21$, $p = .232$, two-tailed.

Table 16

2012 Third Grade Performance Series in Math

.Math Area	ECSE	Non-ECSE	*p*
Scaled Score	2339	2260	.046*
Standard Item Pool	73	67	.232
National Percentile	49	32	.013*
Grade Level Equivalency	4.1	3.5	.018*

Summary

Early learning experiences impact the skills and competencies a child has upon entering kindergarten (NAEYC, 2009). Developmental skills and abilities vary from child to child and are not always in alignment of the chronological age of a young child (NAEYC, 2009). High-quality educational services are designed to meet the developmental needs of each child (NAEYC, 2012b). For at-risk students, early learning programs have emerged as a foremost source of support and education (NIEER, 2013).

The need for increased funding of early learning interventions and opportunities continue to be a necessity for meeting the needs of all students (Barnett et al., 2012). State spending per child decreased to $2,682 in 2012 from $3,051 in 2010 (Barnett et al., 2012). The preschool enrollment was 803 students in 2012 for the ABC school district (MODESE, 2012). The average preschool enrolled from 2010 to 2012 averaged 763 students (MODESE, 2012).

The purpose of this study was to determine if there was a significant difference between the academic achievement of students participating in ECSE services compared to students with no ECSE services in ABC school district. This causal-comparative study utilized multiple *t*-tests to determine whether there was a significant difference between the means of students' scores who received ECSE services compared to similar peers who did not have ECSE services as measured by the TerraNova at second grade and the Performance Series at third grade (Bluman, 2009; Fraenkel & Wallen, 2009). The 2008 to 2012 secondary data were utilized to determine if there was a significant difference between 30 students who had received ESCE services prior to entering kindergarten and

30 non-ECSE students with low DIAL-3 scores when comparing academic achievement scores at the second and third grade levels.

On the second grade TerraNova assessments, scaled scores were utilized in answering the research questions. The TerraNova scaled scores on the overall, reading, and math were compared to the ECSE and non-ECSE students' scores to determine if there was a significant difference. The TerraNova was given at the end of the 2011 second grade school year. On the third grade Performance Series assessments, scaled scores and standard item pool scores were utilized in answering the research questions. The 2012 end-of-year third grade assessment scores were analyzed to remain consistent with the second grade TerraNova assessment window.

In Chapter Five, a summary of the study was presented. Then, the findings were revealed for each research question. Limitations of the findings and the relationship of the findings to the conceptual framework were discussed. Conclusions, implications for future practice, and recommendations were disclosed.

Chapter Five: Conclusions and Recommendations

The education of young children prior to the entry of kindergarten has increased in the United States. Laws have been implemented to provide accountability and support for children at an early age. The eligibility requirements vary from state to state for Early Childhood Special Education (ECSE). However, the lasting effect of "early childhood education and care improves children's cognitive abilities, helps to create a foundation for lifelong learning, makes learning outcomes more equitable, reduces poverty and improves intergenerational social mobility" (Organization for Economic Cooperation and Development, 2012, p. 9). Early childhood learning opportunities influenced the school readiness skills of students with disabilities comparable to non-disabled peers entering into kindergarten (Phillips & Meloy, 2012).

Meanwhile, the per-child state expenditures have dropped "more than $1,100 adjusting for inflation, a decline of 23 percent" since 2002 (NIEER, 2013, p. 19). In conclusion, NIEER (2013) found, "half of the decline in state spending for pre-k took place in 2011-2012 after the economic stimulus funds were largely gone" (p. 19). Although funding continues to decrease, the trend of improving quality early learning opportunities continues to be a goal for many communities (NIEER, 2013). Many states are working on aligning early learning standards to the Common Core State Standards (NIEER, 2013). This alignment includes participation of the "early childhood education community to ensure … evidence-based approaches to supporting the development of young children … to ensure equity in educational opportunity and achievement for all children" (NAEYC, 2012b, p. 9). The monetary support for high-quality early childhood

programs are a responsibility vital in the educational investment of young children (Walsh & Sanchez, 2010).

In the Phillips and Meloy study (2012), significant increases in literacy scores for pre-k program students with disabilities were revealed. There were no significant increases in math scores (Phillips & Meloy, 2012). In the Allen study (2009), kindergarten screening scores were compared between students receiving any type of early childhood services to students without any type of early childhood services (PAT, pre-school, ECSE). Based on the means, Allen (2009) determined students who participated in any type of an early childhood program had statistically significant higher school readiness screening scores (.0370) compared to students without any type of early childhood program services.

Summary of Study

The purpose of this study was to determine if there was a significant difference between the academic achievement of students participating in Early Childhood Special Education (ECSE) compared to students without ECSE services but with low DIAL-3 scores ranked in the 20th percentile or less. The TerraNova is a district assessment given at the end of the second grade year. It measures overall performance, reading, and math skills. The Performance Series is a district assessment given at the third grade level three times a year. The reading, language arts, and math skills are measured at the beginning, middle, and end of the school year. The third grade end-of-year Performance Series scores were utilized in this study to compare to the TerraNova end-of-year second grade assessments. The district achievement scores of students with previous ECSE services

were analyzed and compared to achievement scores of non-ECSE students with DIAL-3 scores up to the 20th percentile.

Findings

The following research questions guided this study and determined the outcomes of hypotheses.

Research question one. What is the difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H1_o$) There is no difference between second grade overall achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The overall achievement scaled scores of the ECSE students were significantly higher than the non-ECSE students, $p = .043$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. The ECSE students' scores were statistically significant at .043 on the overall assessment compared to scores of the non-ECSE students.

Research question two. What is the difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

(*H2o*) There is no difference between second grade reading achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The TerraNova reading achievement scaled scores of the ECSE students were not significantly different when compared to the non-ECSE students, $p = .072$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to fail to reject the null hypothesis.

Research question three. What is the difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H3_o$) There is no difference between second grade math achievement scaled scores as measured by the TerraNova for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The TerraNova math achievement scaled scores of the ECSE students were not significantly different when compared to the non-ECSE students, $p = .070$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to fail to reject the null hypothesis. The differences in the scaled scores between the two groups were not at a statistical level of significance (.070).

Research question four. What is the difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H4_o$) There is no difference between third grade reading achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series reading scaled scores of the ECSE students were significantly higher than the non-ECSE students, $p = .014$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. In the area of reading, the ECSE students' scaled scores were statistically significant (.014) compared to the non-ECSE students.

Research question five. What is the difference between third grade reading achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H5_o$) There is no difference between third grade reading achievement standard item pool scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series reading standard item pool scores of the ECSE students were significantly higher than the non-ECSE students, $p = .001$. The p value of statistical

significance was established at .05. The *p* value of high statistical significance was established at .01. As a result, there was sufficient evidence to reject the null hypothesis. In the area of reading, the ECSE students' scaled scores were highly statistically significant (.001) compared to the non-ECSE students.

Research question six. What is the difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H6_o$) There is no difference between third grade language arts achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series language arts scaled scores of the ECSE students were significantly higher than the non-ECSE students, $p = .028$. The *p* value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. The language arts scaled scores were at a statistically significance level for the end of the year scaled scores (.028) for the ECSE students compared to the non-ECSE students.

Research question seven. What is the difference between third grade language arts achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H7_o$) There is no difference between third grade language arts achievement

standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series language arts standard item pool scores of the ECSE students were significantly higher than the non-ECSE students, $p = .029$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. The language arts scaled scores were at a statistically significance level for the end of the year standard item pool scores (.029) for the ECSE students compared to the non-ECSE students.

Research question eight. What is the difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H8_o$) There is no difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series math scaled scores of the ECSE students were significantly higher than the non-ECSE students, $p = .046$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. The scaled mean scores were at a statistically significant positive level in math (.046) between the students with previous ECSE services compared to students with no previous ECSE services.

Research question nine. What is the difference between third grade math achievement scaled scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services?

($H9_o$) There is no difference between third grade math achievement standard item pool scores as measured by the Performance Series for students who received ECSE services and those students with DIAL-3 scores ranked in the 20th percentile or below but did not receive services.

The Performance Series math scaled scores of the ECSE students were significantly higher than the non-ECSE students, $p = .232$. The p value of statistical significance was established at .05. As a result, there was sufficient evidence to reject the null hypothesis. The standard item pool scores were at a statistically significant positive level in math (.232) between the students with previous ECSE services compared to students with no previous ECSE services.

Limitations of Findings

In this study, there were approximately 200 ECSE students transitioning to kindergarten yearly. Of the 200 students, achievement scores for 30 of the ECSE students were analyzed. Prior to kindergarten entry, a DIAL-3 assessment was given. For the purpose of this study, students with low DIAL-3 scores were ranked in the 20th percentile or below but did not receive ECSE services. Achievement scores for 30 non-ECSE students with low DIAL-3 students were analyzed and compared to the 30 ECSE students. While the 60 participants were limited to a single school district, generalizations can be made about the overall significance of early intervention and student achievement.

However, the study could not be replicated for students prior to the 2008 or after 2012 due to the changes in assessments. The assessments given to the participants were different prior to 2008 (Performance Series) and after 2012 (DIAL-4). As a causal-comparative study, it is important to view this study with caution.

Relationship of Findings to Conceptual Framework

A constructivism theory perspective was utilized in the educational development of young children. In addition to the cognitive approach, the social components of developmental stages of young children were used. The growth of a developing child is complex with many factors impacting school readiness. In both theories, significance is placed on the child being an active, inquisitive learner (McLeod, 2012; 2013). In addition to the early stages of learning, the cultural and social aspects are just as vital in a young child's developmental growth. Therefore, Vygotsky's social constructivism theory has been utilized to explore the development of a young child as an individual, family member, and part of the community.

The results of this study revealed significantly higher academic scores for children in an ECSE program prior to kindergarten entry compared to students with low DIAL-3 scores in the 20th percentile or lower with no services. Students who attended ECSE were provided with educational opportunities for half days up to four times a week with certified teachers. Additional services in the ECSE setting may have included speech, language, and fine or gross motor therapy sessions. The curriculum is based on the state's early learning standards.

Conclusions

In this study, second and third grade achievement scores of 30 ECSE students were compared to 30 non-ECSE students with low DIAL-3 scores. When comparing the ECSE and non-ECSE achievement scaled scores at the second grade level on the TerraNova assessment, there was a statistically significant difference for the ECSE students on the overall total scaled scores compared to the non-ECSE students. Conversely, the reading and math scaled scores were not statistically significant at the second grade level. However, the ECSE students' mean scores exceeded those of the non-ECSE group on all components of the TerraNova.

When comparing the third grade Performance Series reading, language arts, and math scaled scores of the ECSE students to the non-ECSE students, the ECSE students had statistically higher achievement scaled scores compared to the non-ECSE students. When comparing the third grade Performance Series reading and language arts standard item pool scores of the ECSE students to the non-ECSE students, the ECSE students had statistically higher achievement standard item pool compared to the non-ECSE students. The Performance Series math standard item pool scores were not statistically significant between the two groups.

Early childhood learning opportunities influence the school readiness skills of students with disabilities comparable to non-disabled peers entering into kindergarten (Phillips & Meloy, 2012). There have been significant increases in literacy scores but not in math for pre-k programs, according to Phillips and Meloy (2012). Results of the Allen study (2009), revealed students who attended an early childhood program prior to

kindergarten obtained statistically greater scores on the readiness screenings (.0370) than students with no early childhood program.

Implications for Practice

There are several implications to support the continuation of early invention programs, such as ECSE from this research. This study's findings supported increased achievement with early interventions. The overall scaled scores at the second grade level were statistically greater for the ECSE students compared to the non-ECSE students. The reading, language arts, and math scaled scores were statistically greater for the ECSE students compared to the non-ECSE students at the third grade level. The reading and language arts standard item pool scores were statistically greater for the non-ECSE students compared to the non-ECSE students. In math, the standard item pool scores were not statistically significant between the ECSE and non-ECSE students for the end-of-year assessments.

In the Phillips and Meloy study (2012), significant increases in literacy scores for pre-k program students with disabilities were discovered. Findings in the Phillips and Meloy research (2012) indicated "high-quality state pre-K programs can serve as effective early intervention programs for children with special needs" (p. 471). While early intervention, education, and care can be beneficial to families and communities, the term of high-quality is conditional (Organization for Economic Co-operation and Development [OECD], 2012). High-quality services are necessary for children, and the OECD (2012) reported, "research has shown that if quality is low, it can have long-lasting detriment effects on child development, instead of bring positive effects" (p. 9).

Funding for early intervention programs and services continue to decrease. Schools continue to strive to meet needs of all children with less money. This study may be useful for directors, superintendents, and school boards in the continuance of support for early childhood programs. Parental involvement is a key component of early childhood intervention success (Pretis, 2011). For that reason, continuing dialogue "related to the effectiveness and efficiency has, to a higher extent, focus on the full participation of parents" (Pretis, 2011, p. 76). The community, as a whole, must work together to offer a network of support systems to continue to close the gap for all children through early interventions.

The U.S. Department of Education (2012) reported, "Today, early intervention programs and services are provided to almost 200,000 eligible infants and toddlers and their families" (para. 6). Although many young children receive services, poverty is a risk factor in receiving early interventions (Peterson et al., 2010). Additionally, Peterson et al. (2010) found "the same poverty-related factors that place their children at higher risk for disabilities also serve as barriers to accessing services for their children and themselves" (p. 509). Furthermore, Peterson et al. (2010) identified four key ideas to guide early intervention professionals in working with at-risk young children and families:

1. Young children living in poverty are very vulnerable; it is essential that all service providers interacting with these children and families be vigilant about identifying disability indicators.
2. Some children from low-income backgrounds are facing multiple challenges that make it difficult for them and their families to participate

in disability-related services; therefore, it is important to develop clear procedures to help program staff members know when and how to refer families for disability-related services.

3. Collaboration among community partners (e.g., Early Head Start programs, health care providers) is having a positive impact on many of these very vulnerable children and families.
4. Practitioners should work to ensure that all families, but especially those whose children have identified risks or a disability, have the supports they need to help their children grow healthy and strong. (p. 510)

Recommendations

This study was limited to 30 prior ECSE students and 30 students with DIAL-3 scores ranked to the 20th percentile with no ECSE services in a single school district from 2008 to 2012. The number of students eligible for free and reduced price meals increased from 50.5% in 2011 to 52.9% in 2012 which was 3.4% higher than the state average (MODESE, 2013b). Poverty continues to be a concern in early childhood education. Students eligible for free or reduced price meals continue to be 4.5% higher than the state average of 49.9% for 2013 (MODESE, 2013b). Budget cuts have been made to some of the early childhood programs, such as Parents as Teachers and Head Start Programs. There was an increase in the ABC school district K-12 enrollment by 497 students; however, students enrolled in ABC school district-sponsored pre-kindergarten programs decreased by 134 students (MODESE, 2013b). The study would be enriched by including a wider variety of pre-kindergarten services including private and parochial pre-school programs.

This study included achievement scores through district level assessments at the second and third grade years. It would be advantageous to analyze the achievement level scores for the 30 students with previous ECSE services and 30 students non-ECSE (low DIAL-3 scores in the 20th percentile rank or below) without ECSE services over a longer period of time. With the focus at the primary years, would statistical significance levels remain consistent throughout the academic years in reading and language arts that are present at the third grade level? Does the gap narrow between the ECSE and non-ECSE groups over a more extensive time period?

The secondary data consisted of the Performance Series, TerraNova, and DIAL-3 scores; however, consideration should be given to engage in a longitudinal study of the same group of ECSE and non-ECSE students by adding a qualitative component. A mixed-method approach would allow feedback from a variety of stakeholders. Perceptions of parents, caregivers, ECSE teachers, school-aged teachers, and administrators would be beneficial to the school district.

Summary

The purpose of this causal-comparative study was to determine if there was a significant difference between the academic achievement of students participating in Early Childhood Special Education (ECSE) compared to similar students without ECSE services but with low DIAL-3 scores ranked in the 20th percentile or less. The TerraNova is a district assessment given at the end of the second grade year. It measures overall performance, reading, and math skills. The third grade end-of-year Performance Series scores were utilized in this study to compare to the TerraNova end-of-year second grade assessments. The district achievement scores of students with previous ECSE services

were analyzed and compared to achievement scores of non-ECSE students with DIAL-3 scores up to the 20th percentile. Secondary data (ECSE and non-ECSE students, DIAL-3, TerraNova, and Performance Series) were collected from 2008 through 2012.

In this study, achievement scores of 30 of the ECSE students were analyzed and compared to achievement scores of non-ECSE students with low DIAL-3 scores in the 20th percentile or less. The study was limited to 60 participants in a single school district. However, generalizations can be made about the overall significance of early intervention and student achievement. The study could not be replicated for students prior to the 2008 or after 2012 due to the changes in assessments. The assessments given to the participants were different prior to 2008 and after 2012. As a causal-comparative study, it is important to view this study with caution.

A social constructivism theory perspective was utilized in the educational development early learning attainment. In addition to the cognitive approach, the social components of developmental stages of young children were used. Significance is placed on the child being an active, inquisitive learner (McLeod, 2012 and 2013). In addition to the learning, the cultural and social aspects are just as relevant in a young child's developmental process. Therefore, Vygotsky's social constructivism theory has been utilized to explore the development of a young child as an individual, family member, and part of the community.

The achievement scaled scores at the second grade level on the TerraNova assessment were statistically greater for the ECSE students on the overall total scaled scores compared to the non-ECSE students. The reading and math scaled scores were not

statistically significant at the second grade level. However, the ECSE students' mean scores exceeded those of the non-ECSE group on all components of the TerraNova. The third grade Performance Series reading, language arts, and math scaled scores were statistically greater for the ECSE students compared to the non-ECSE students. The Performance Series reading and language arts standard item pool scores of the ECSE students were statistically greater than scores of the non-ECSE students. The Performance Series math standard item pool scores were not statistically significant between the two groups.

Implications from this study include the need for continuation of early invention programs, such as ECSE. This study's findings supported increased achievement with early interventions, and the findings may serve as valuable information for directors, superintendents, and school boards in the diligent support of early childhood programs. The stakeholders within the community must work together to offer a network of support systems to continue to close the gap for all children through early interventions.

Appendix A

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

Date: January 16, 2013

Please note that Lindenwood University Institutional Review Board has taken the following action on IRBNet:

Project Title: [412978-1] Early Childhood Special Education and the Impact on Student Achievement
Principal Investigator: Alana Hillman
Submission Type: New Project
Date Submitted: January 8, 2013

Action: APPROVED
Effective Date: January 16, 2013
Review Type: Expedited Review

Should you have any questions you may contact Beth Kania-Gosche at bkania-gosche@lindenwood.edu

Thank you,

The IRBNet Support Team

Appendix B

[redacted] Public Schools Exists For the Academic Excellence of All Students

To: Alana Hillman

From: Research Review Committee

Date: July 9, 2013

Subject: Request to Conduct Research

Your request to conduct research proposal titled, Early Interventions and Student Achievement, submitted for consideration has been approved by the [redacted] Public Schools' Research Review Committee.

Feel free to contact Dr. Cathy Galland if you have questions or need additional information.

Good luck with your research project!

[redacted] Public Schools Research Review Committee

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Vita

Alana Hillman has been a Special Education Process Coordinator for Springfield Public Schools in Springfield, Missouri, since 2006. Educational administrative experiences included three years as the Special Education Assistant Coordinator for Extended School Year. Teaching experiences included third, fifth, and sixth grades at Dadeville R-II School District, Dadeville, Missouri. Additional teaching experience was completed in K-5 in Springfield Public Schools, Springfield, MO. While teaching in Springfield Public Schools, Alana had the opportunity to be the Extended Learning Program liaison as well as additional duties assigned when the principal was out of the building.

Alana earned her Specialist in Educational Administration degree from Missouri State University in 2006. She earned her Master of Science degree in Education in 1999 from Missouri State University. Her Bachelor of Science degree was earned in Education 1989 from Missouri State University.