

Running head: EFFECTS OF EARLY INTERVENTION

The Effects of Early Intervention Programs on Kindergarten Readiness for Students with
Disabilities

By

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of

Education

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April 30, 2020

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Dedication

I dedicate this work to my Wolfe Pack. First to my husband Jason who supported me when I decided to take on this crazy journey and never doubted my ability to reach my goal. To my daughter Sithney who unselfishly and with excitement shared her graduation year with me. To my son Aidan whose words of encouragement and questions about my work kept me motivated to get things done. To all three whose love and support have made this journey called life an adventure I will always cherish. I look forward to less time at the kitchen table doing research and more time having family dinners, conversations, and game nights.

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Acknowledgments

Thank you to all of those who became part of this study, but most importantly part of my life during this process.

I would like to express my sincerest appreciation to my dissertation chair, Dr. Mark Dula, and my committee members Dr. Angela Hilton-Prillhart and Dr. Patrick Kariuki. Your wisdom and guidance were instrumental in my successful completion of this work.

To my tribe, there are not enough words to say thank you for your willingness to always listen, laugh (sometimes cry) with me, and encourage me over the course of this journey. I look forward to making up for our missed dinners and porch parties.

The list is long of those who have encouraged, read and proofed, answered questions, and gave guidance; I appreciate each of you for the part you played in this work and my life over the past two year.

This work would not have been possible without the early intervention coordinator and teachers in the selected district. You are a fantastic group of educators and individuals. Keep doing what you do! The impact you have on children every day is invaluable.

Lastly, my cohort in crime, I cannot imagine taking on this challenge with any other group of professionals. In the end, I am most grateful to call you friends.

“We must find time to stop and thank the people who make a difference in our lives.”

- John F. Kennedy

Abstract

Purpose of the quantitative study was to determine effects of early intervention participation on kindergarten readiness focusing on students with disabilities. The study was a quasi-experimental design measuring growth during a six-month timeframe by administering a pre-assessment and post-assessment in a select school district in Upper East Tennessee. The sample population was 113 students four and five-years in age, including 30 students with disabilities. The study suggested participation in early intervention programs had a positive impact on growth scores of participating students for overall general development and five developmental domains. Research did not yield a significant difference in post-assessment scores for overall general development or five developmental domains for students with disabilities based on the number of participating years in early intervention programs.

Keywords: Children with Disabilities, Developmental Profile™ 3, Early Childhood, Early Intervention, Kindergarten Readiness, Preschool, School Readiness, Special Education, Student Growth, Students with Disabilities

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Chapter 1: Introduction

Shifts in academic expectations of kindergarten have given education professionals reason to ask essential questions about how preschool fits into children's overall school careers. The Office of Early Learning for the Tennessee Department of Education has established the following vision: "Every child in Tennessee, from birth to age eight, will engage in rich, joyful, learning experiences that purposefully develop leaders, thinkers, and innovators of tomorrow." Driving work of the vision for the Office of Early Learning is the mission, "optimize quality learning and prevent potential achievement gaps in the early years when children's brains develop the most" (TDOE, 2018). The primary focus of preschool education has shifted from programs revolving around a day of play to a more academic model; the model is not a learning environment without play, but one in which academic work and learning are defined as play with purpose. The model is based on the assumption preschool participation increases kindergarten readiness related to social-emotional and academic aspects (Hatcher, Nuner, & Paulsel, 2012; TDOE, 2018).

Educators have developed a number of formative and summative assessment tools to assess readiness, yet very little research is available about the growth of children enrolled in an early intervention program for a current school year. Available research focuses on long-term impacts of attending preschool for students on a state achievement test, post-secondary outcomes, academic performance, and social-emotional outcomes in years beyond the preschool experience. "Classic, long-term evaluations of early childhood programs and theories from the economic developmental literatures on skill-building argue that preschool effects are likely to persist over time because these programs can provide children with foundational skills necessary for after school success" (Ansari, 2018, p.952-53).

Background of the Study

Given a positive early experience has significant implications for later school achievement and adjustment, transition to kindergarten is recognized as a significant developmental milestone in early childhood (Welchons & McIntyre, 2015). This transition is challenging for children with or at-risk for disabilities given deficits in essential adaptive and socio-behavioral competencies. Early intervention programs provide a unique experience for children when they start the developmental journey of acquiring skills and subsets needed to be successful in kindergarten (McIntyre et al. 2006; Zucker, 2010). According to Rimm-Kaufman and Pianta:

Kindergarten is a different environment than preschool or home. Goals, demands, and the nature of the classroom environment are different, as is the ecology surrounding this new environment. Kindergarten typically has quite explicit goals for literacy, numeracy, and socialization that are not formal, stated goals of preschool or home environments (2000, p. 493).

The Child Parent Center (CPC) study, operated by Chicago's public schools, revealed enrollment in preschool leads to many benefits; the CPC study involved a large-scale, longitudinal study that began in the late 1960s. The CPC assigned a certified teacher and assistant to a classroom of 18 children with results showing "early education leads to positive outcomes in test scores, crime, special education, and high school graduation" (Morgan, 2019, p.2). There is a need for yet a lack of available high-quality Early Childhood Education (ECE) programs to "increase the number of students who enter kindergarten prepared with the basic academic and social skills needed to succeed in school" (Modeste, 2016, p. 5).

The current study takes into consideration effects of early intervention on kindergarten (school) readiness for students with disabilities in one Upper East Tennessee school district. Effects are determined by a comparison of performance for typical peers, participating years for students in an early intervention program, program model, benchmark norms, all five domains, and overall general development as defined on the Developmental Profile™ 3 (DP™ -3). With an estimated 15% of children in the United States having at least one developmental delay, data collected as part of the study could impact allocation of resources, budgetary and personnel, of the district to better support implementation of more high-quality early childhood education programs (Vitrikas, Savard, & Bucai, 2017).

Statement of the Problem

To be eligible for Special Education Preschool Grants, Part B, Sec. 619, states the following:

Public schools must serve all eligible children with disabilities aged three through five and have an approved application under Part B of the Individuals with Disabilities Education Act (IDEA). These services must include an educational component that promotes school readiness and incorporates preliteracy, language, and numeracy skills (U.S. Department of Education, 2016b).

The Tennessee Department of Education, through the Kindergarten Education Inventory (KEI), measures five domains of student readiness; these domains emphasize students' attainment of knowledge, skills, or behaviors imitating each domain's developmental constructs. In 2015, 67% of children four years old in the United States were enrolled in a preschool program if they were not in kindergarten (Lipsey, Farran, & Durkin, 2018). Providing instruction to meet criteria for

kindergarten (school) readiness in five identified areas (physical, adaptive, social-emotional learning (SEL), cognitive, and communication) is the goal of student learning.

Based on goals of student learning and a desire for students to be kindergarten ready, the selected school district developed a curriculum using balanced literacy and Everyday Math. In 2018, all programs in the district adopted *Connect4Learning: The Pre-K Curriculum* to guide instruction of students ages four and five. Benchmark assessments administered three times throughout the school year measure achievement, skills, and standards. Teachers use data from assessments to guide instruction and provide enrichment and remedial opportunities as needed by individual students.

Consequently, teachers, school administrators, and district administrators use this information to determine if a student participates in a specialized learning environment (a.k.a self-contained classroom) or a general education class when they enter kindergarten. Therefore, it is essential to determine not only a student's proficiency rate on skills and criteria but to measure growth during the pre-kindergarten years through a norm-referenced, valid, and reliable, standardized pre- and post-assessment.

Purpose of the Study

The purpose of the quantitative study is to determine effects of early intervention participation on kindergarten readiness for students with disabilities enrolled in one of the four- and five-year-old programs in one selected school district in Upper East Tennessee. By administering the Developmental Profile™ 3 (DP™ -3) on two separate occasions during a six-month timeframe during a single school year, growth in all five domains and overall general development will be measured. Data resulting from the assessment will measure (a) growth for students enrolled in one district's early intervention programs, (b) growth of students with

disabilities between the two class types in the district, (c) general education student growth in comparison to students with disabilities growth, (d) students with disabilities multi-year growth in comparison to single-year growth, (e) students with disabilities growth significance, and (f) program participants versus typical student benchmark.

Research Questions

1. Is there a significant difference in the pre-assessment and post-assessment overall general development score for students enrolled in the early intervention program?
2. Is there a significant difference in the pre-assessment and post-assessment scores in the five developmental domains for students enrolled in the early intervention program?
3. Is there a significant difference between general education and special education student growth in the five developmental domains?
4. Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly different growth for overall general development than students with disabilities who participated in the special education classroom?
5. Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly different growth in the five developmental domains than students with disabilities who participated in the special education classroom?
6. Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth for overall general development than general education students in the same classroom?

7. Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth in the five developmental domains than general education students in the same classroom?
8. Is there a significant difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years?
9. Is there a significant difference on the post-assessment for the five developmental domains for students with disabilities when comparing students who were enrolled in the early intervention program for the current year or multiple years?
10. Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development?
11. Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment across the five developmental domains?

Significance of the Study

Students identified as a student with a disability (a.k.a. special education or “at-risk”) have an area of deficit or delay as diagnosed using the eligibility criteria defined by federal and state guidelines. The goals of an early intervention or preschool program are to narrow or close the gap for identified sub-groups, provide inclusive experiences, and provide skills deficit intervention: “Early childhood intervention programs are designed to mitigate the factors that place children at risk of poor outcomes” (RAND, 2005b, p.1). The enrollment in an early intervention program allows for a learning environment that integrates services and supports for students with disabilities.

Many states have been advised to increase funding for early intervention programs to serve a more significant number of students, specifically those children identified as “high-risk” or in identified sub-groups (Parker, Atchison, & Workman, 2016). Tennessee has funded its early intervention programs through the Tennessee State Department of Education using the state’s Basic Education Provision (BEP) formula and districts cover remaining costs through local funds. Additional options for funding include school districts applying for Voluntary Preschool (VPK) grants, using Title I federal funds, establishing paid programs, and working with federal Individuals with Disabilities Education Act (IDEA), Part B and 619 funding (Lipsey et al., 2018). Results of the study will add documented information regarding the effectiveness of early intervention on kindergarten readiness for all students, focusing on students with disabilities. Information gathered has potential to validate district efforts to continue funding early intervention programs and increase community support through increased resources, personnel, and capital.

Definition of Terms

The following definitions of terms guarantee understanding and consistency throughout the study. The researcher drafted definitions without a citation.

Adaptive behavior: the ability to cope independently with the environment (i.e., to eat, dress, work, use current technology, and take care of self and others) (Alpern, 2017).

Assessment: Systematic practice of gathering data to document and evaluate academic and skill acquisition.

Children with disabilities: children who are eligible for special education services and who have individualized education plans or programs (IEPs) (Sandall, Schwartz, Joseph, & Gauvreau, 2019).

Cognitive: intellectual abilities and skills prerequisite to academic achievement (Alpern, 2017).

Communication: expressive and receptive communication skills, including written, spoken, and gestural language (Alpern, 2017).

Developmental Profile™ 3 (DP™ -3): assessment instrument used to evaluate children's functioning in five critical areas defined by the study.

Early Intervention: a system of coordinated services promoting age-appropriate growth and development and supports families during the early years.

Head Start: a federal program for preschool children three to five years of age in low-income families that offers comprehensive early childhood education, health, nutrition, and parent involvement services to low-income children ages three to five.

High-quality early childhood program: one that is inclusive of children with disabilities and their families and ensures that policies, funding, and practices enable full participation and success (HHS & ED, 2015).

Inclusion/inclusive environment: an educational practice or environment in which students with disabilities (SWD) are fully integrated into the general education classrooms with the same age, typical peers at the school; classroom environments with less than fifty percent of SWD on the class roster.

Individualized Education Program or Plan (IEP): a document prepared for students, ages three through 21 years, who are eligible for special education services; requirement by IDEA 2004 (Sandall et al., 2019).

Least Restrictive Environment (LRE): requires, to the extent possible, children with disabilities have access to the general education curriculum, learning activities, and settings along with typical peers (DEC/NAEYC, 2009).

Learning trajectories: a foundational concept of C4L; it includes the goals of learning, thinking and learning processes of children at various developmental levels, and learning activities used to move children toward learning goals (Sarama, Brenneman, Clements, Duke, & Hemmeter, 2016).

Physical: large and small muscle coordination, strength, stamina, flexibility, and sequential motor skills.

Regular early childhood program: a program that includes a majority (at least 50 percent) of nondisabled children (i.e., children who do not have IEPs) (ED & OSERS, 2017).

School Readiness: children are ready for school; physical, cognitive, social-emotional development are all essential ingredients of school readiness. The expectations of children's status and progress across domains of language and literacy development, cognition and general knowledge, approaches to learning, physical well-being and motor development, and social-emotional development improve readiness for kindergarten goals [Terms, 45 CFR § 1305.2] (HHS, 2019).

Social-emotional: interpersonal skills, social-emotional understanding, functioning in social situations, and how the child relates to peers and adults.

Special Education: specialized services and supports provided to students with identified disabilities intended to meet their unique learning needs, allowing them to progress to achieve their full potential.

Students with Disabilities: see Children with Disabilities

Typical Peer: children or students who are not receiving special education services.

Voluntary Preschool or Voluntary Pre-K (VPK): an initiative providing Tennessee's at-risk three- and four-year-old students an opportunity to develop school readiness skills.

Limitations

The study includes data gathered from early intervention programs in a single, urban school district in Upper East Tennessee during one school year. Research is focused on the selected school district's early intervention programs for students four and five years of age, including Title I, Voluntary Preschool (VPK), Special Education (619), and self-funded early learning programs. The district provides early intervention for 286 students in 17 classrooms, including 65 students with disabilities. Depending on funding sources and the commitment to early intervention, the research might not transfer to another school district. Affecting variables in addition to funding allocations could include student to adult ratios, class size, curriculum implementation, and hours of service each day or week.

Curriculum and Instruction

All early intervention programs in the selected district have adopted Connect4Learning: The Pre-K Curriculum for the instruction of students ages four and five. The district has not adopted a pacing guide for their early intervention programs; therefore, there is no guarantee all teachers cover the same content and standards during the timeframe between the pre- and post-assessment.

Quality of the Program

Whether state pre-k programs generally are of high or low quality is an open-ended question. The only effort to compare quality across states is in the National Institute for Early Education Research (NIEER). These reports identify the ten standards NIEER promotes and

which are met by each state program. Tennessee has one of the better programs, meeting nine of the standards (Lipsey et al., 2018). The researcher assumes all early intervention programs in the district are high-quality programs based on the NIEER reports.

Assessment

Assessment administrators were provided direct instruction on how to complete the DPTM-3 for students on the roster. No method was identified to guarantee each teacher (assessor) accurately administered the assessment or used the same standard for each indicator to define mastery or evidence of observable skills.

Summary

Early intervention services provided to students ages four and five must include educational components promoting kindergarten (school) readiness (ED, 2016a; ED, 2016b). School readiness is measured using five domains that place importance on students' attainment of knowledge, skills, or behaviors emulating the appropriate developmental constructs. Providing instruction to meet criteria for kindergarten (school) readiness in physical, adaptive, social-emotional, cognitive, and communication is the goal of student learning. Utilizing data to demonstrate growth for students enrolled in one district's early intervention programs could reveal the effectiveness of preparing students for success in school and support school district efforts to fund early intervention programs at a higher degree and increase community support.

Organization of the Study

Chapter 1 encompasses the introduction, statement of the problem, purpose of the study, research questions, significance of the study, definition of terms, study limitations, scope and delimitations, and assumptions. Chapter 2 includes the review of interrelated literature and research focusing on the importance of early intervention, screening and intervention for students

with disabilities, and different program options for early intervention. Methodology and procedures used to collect data are defined in Chapter 3. Chapter 4 provides results for analysis of data and study findings. Chapter 5 summarizes study and its findings, ensuing conclusions, a discussion, and future study recommendations.

Chapter 2: Literature Review

“All children need and deserve a good start. Attending a high-quality early childhood program is an important part of starting early and starting right” (NEA, 2008, p. 1). Along with the continued growth and investments in early intervention and the recognition of its importance to align with K – 12 education, focus on accountability and early childhood outcomes are evident. During the last five years, a substantial amount of consideration has been given to the debate around effectiveness of early intervention (preschool). Questions about whether early intervention is effective in the short term and if positive outcomes sustained over time have led to the belief that preschool is held to a higher standard than any other single grade in the education system (Sandall et al., 2019). Many theories exist regarding the impact of early intervention or preschool programs for students and current research covers a variety of relevant theories. These theories bring attention to lasting effects of preschool participation for students on state achievement tests, social-emotional and post-secondary outcomes, and academic performance beyond the preschool experience. Review of the literature will focus on the following themes:

- kindergarten/school readiness taking into consideration cognitive and academic skills and social-emotional competencies;
- assessments including identifying developmental delays and information about the Developmental Profile™ 3 (DP™ -3);
- early intervention environments and inclusion model;
- benefits for students with disabilities; and
- funding sources and implications.

Although literature presents themes in a variety of contexts, this review will focus primarily on application to kindergarten readiness.

Kindergarten or School Readiness

No universal definition of kindergarten readiness exists; therefore, states and local school agencies have focused on skills determined most necessary for students to develop before kindergarten. Physical (fine/gross motor), adaptive (self-care), social-emotional, cognitive (academics), and communication skills are developmental domains appearing consistently in individual definitions. Similarly, a common theme among definitions is a belief kindergarten readiness is more than consideration of isolated skills; it encompasses all skills and strengths a child has developed before starting school. Osborn stated kindergarten readiness is the "strong, mutual belief in lifelong learning that begins at birth and happens all day long in the life of a child" (2017, p.70).

“Young children may begin their schooling with great differences or disparities, which argues the need for support and interventions to begin earlier...” (Hansen, Miller, Diamond, Odom, Lieber, Butera, Horn, Palmer, & Fleming, 2011, p.9). The National Association for the Education of Young Children (NAEYC) holds fast to the belief schools have the responsibility to meet the needs of children as they enter school, providing necessary services and supports, allowing access to school and for children to reach their fullest potential. Early intervention starts school experience with a focus on commitment to promoting school readiness by considering experiences of young children, developmental levels, and appropriate expectations. Readiness requires giving all children access to the opportunities promoting school success, recognizing and supporting children’s differences, and establishing realistic and appropriate expectations for what children should be able to do when entering school (DEC/NAEYC, 2015).

“Preschool teachers foster curiosity and critical thinking skills children need to be ready for the challenge of kindergarten” (Osborn, 2017, p.67). Preparing students to manage the expectations of a kindergarten curriculum and providing opportunities to gain skills not mastered before the school experience are reasons participation in an early intervention program is beneficial to young children. According to information compiled by the Encyclopedia on Early Childhood Development, children are more likely to be successful transitioning to kindergarten if they (a) exhibit early signs of cognitive ability, maturity, and social and self-regulatory skills, (b) have had access to high-quality preschool or early education programs, and (c) have positive relationships with teachers and peers (Melhuish, 2012). The NEA cites evidence the “school readiness” gap starts prior to a student entering school and places children at risk of future failure in the school environment (2008).

Cognitive and Academic Skills

Educational research and literature repeatedly use the terms cognitive and academic skills interchangeably when referencing early intervention programs. Early intervention programs have potential to develop and improve skills promoting learning, specifically skills related to cognitive function and academics. Cognitive skills are defined as the “intellectual abilities and skills prerequisite to academic achievement” and referred to as executive function skills (Alpern, 2017). The skill sets specifically include the ability to resist temptations and distractions, hold and use information (working memory), and adjust to change (flexibility). Leseman recognized the three essential executive functions: Working memory (updating), inhibitory control, and flexibility (shifting); however, he also identified the debate if specific functions are truly discernable in young children (2012).

The ability to hold a limited amount of information for processing and updating (working memory), the ability to inhibit an effective response and resist distraction (inhibition), and the ability to switch between activities and strategies (flexibility) are skills allowing the brain to process information and master cognitive skills. In an early intervention program, these skills are challenged each day, allowing for generalized benefits and transference for young children (Diamond, 2007; Leseman, 2012). Diamond hypothesized:

Improving [executive function skills] EFs early may have increasing benefits over time and may reduce needs for costly special education, societal costs from unregulated antisocial behavior, and the number of diagnoses of EF disorders (ADHD and conduct disorder...and are more strongly associated with school readiness than are intelligence quotient (IQ) or entry-level reading or math scores. Kindergarten teachers rank skills like self-discipline and attentional control as more critical for school readiness than content knowledge (2011, p.1387-88).

Most research in education focuses on long-term impacts of attending an early intervention program with evidence suggesting benefits beyond short-term academic and psychosocial benefits for children transitioning to kindergarten. Results of research show benefits continue through childhood, adolescence, and young adulthood. Ansari suggested earlier academic achievement and psychosocial functioning serve as valuable predictors for the long-term benefits of preschool for participating children (2018). Instructional activities as part of academic content promote self-regulation. Encouraging children to articulate plans and evaluate self-performance bridges external responses and self-regulation (Leseman, 2012).

Research overall shows an impressive return on investment into high-quality preschool programs and an agreement that early intervention programs improve education outcomes, health

effects, and economic prosperity for children, families, and the nation. Parker, Workman, and Atchison presented an analysis of 84 preschool programs showing a gain of added learning across language, reading, and math skills when attending high-quality preschool programs of about one-third of a year (2016). Students in early intervention programs experienced more significant gains in literacy, language, and math skills with a higher level of readiness for grade-level work (Lipsey et al., 2018).

“It has been asserted that what children learn about literacy and other skills in the early years facilitates the acquisition of skills when they begin instruction in school” (Bus, Leseman, & Neuman, 2012, p.527). In 2017, around 1.5 million children were participating in state-funded early intervention (preschool) programs. Studies included in research suggested several outcomes resulting from student participation. In essence, a growth in letter-word identification, spelling, and early numeracy skills, improved attention skills and lower reticence at the kindergarten transition, and a higher level of executive functioning and emotion recognition in kindergarten (Johnson, Finch, & Phillips, 2018). Students who do not participate in early intervention programs have a higher chance of entering kindergarten with more significant differences in academic and social development, consequently contributing to their academic achievement gap. In the years after preschool, this gap is harder and more costly to close (Morgan, 2019). In 1975, Sameroff and Chandler presented a “compensatory theory of education” based on the study of several preschool settings including school-based, community-based centers, and home-based care. The compensatory theory focused on an intensive approach to early intervention founded on the belief that instruction, materials and resources provided in early intervention settings were supplemental to what children would get at home. Compensatory

effects are observed most often for children who would be identified as at-risk, including students with disabilities (as cited by Johnson et al., 2018).

“Disparities in educational achievement are established early in the life course, and once these gaps are established, children’s prospects of upward mobility are diminished...disparities in early learning and development are, thus, the underpinning for later inequality, which is why the early childhood years serve as a critical juncture for intervening in children’s long-term educational careers” (Ansari, 2018, p.252).

Social-Emotional Learning

Some research suggests experiences related to social-emotional learning before kindergarten are an essential prerequisite to academic development, and there is a strong link between young children's socio-emotional competence and chances of early school success. Consequently, any measure of adaptive kindergarten transition would include skills encompassed within social-emotional learning and would imply behavioral regulation is the foundation needed for attainment of academic skills. The same research suggests a strong correlation between behavioral functioning of young children and high-quality early intervention programs (Welchons & McIntyre, 2015; Im, Jiar, & Talib, 2019; Romana, Kohen, & Findley, 2010). The Collaborative to Advance Social-Emotional Learning (CASEL) has established five Social-Emotional Learning (SEL) clusters shown in Figure 1 with the following definitions (2019).

1. Self-awareness: The ability to accurately recognize one’s own emotions, thoughts, and values and how they influence behavior. The ability to accurately assess one’s strengths and limitations, with a well-grounded sense of confidence, optimism, and a “growth mindset.”

2. **Self-management:** The ability to successfully regulate one's emotions, thoughts, and behaviors in different situations — effectively managing stress, controlling impulses, and motivating oneself. The ability to set and work toward personal and academic goals.
3. **Social awareness:** The ability to take the perspective of and empathize with others, including those from diverse backgrounds and cultures. The ability to understand social and ethical norms for behavior and to recognize family, school, and community resources and supports.
4. **Relationship skills:** The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. The ability to communicate clearly, listen well, cooperate with others, resist inappropriate social pressure, negotiate conflict constructively, and seek and offer help when needed.
5. **Responsible decision-making:** The ability to make constructive choices about personal behavior and social interactions based on ethical standards, safety concerns, and social norms. The realistic evaluation of the consequences of various actions and a consideration of the well-being of oneself and others.

Figure 1*CASEL Wheel*

Welchons and McIntyre conducted a study intended to examine if transition preparation activities in the spring of preschool and fall of kindergarten predict socio-behavioral outcomes. Consistent with earlier studies, findings from their research suggest adaptive and problem behaviors of young children are vital predictors of kindergarten outcomes for students with and without disabilities (2017). Research compiled by Modeste is consistent with these findings and further emphasizes the importance of social-emotional learning to promote kindergarten (school) readiness. The study shows absence of early intervention participation has been associated with a higher number of behavioral problems, and for those who participate there is evidence of higher cognitive-academic achievement and lessened struggle related to behavior or social-emotional learning outcomes (2017).

The transition to kindergarten signifies a crucial early childhood development milestone, and young children benefit from a structured environment as a component of a high-quality early intervention program (Im et al., 2017; Modeste, 2017; Welchons & McIntrye, 2015). “The development of social-emotional competence (SEC) is an important foundation for young children to achieve success in schools and later lives...The development of children's social-emotional and behavioral skills have been linked to greater educational success” (Im et al., 2019, p. 158).

Assessment

The lack of a current definition of kindergarten (school) readiness has resulted in no universal readiness assessment instrument identified; however, many instruments are accessible to use as measures of the identified readiness domains. Evaluation of school readiness is measured using both formal and informal tools, including play theories, observations, broad-based learning domains, and specific skill assessments. Early intervention strategies and school readiness assessments that take a comprehensive view of child development are most effective in supporting and measuring a child’s kindergarten readiness (Daily, Burkhauser, & Halle, 2010).

Although a universal instrument has not been agreed upon, researchers and education professionals do agree that measuring school readiness should encompass assessing the “whole child” (Acar, Hansen, Dolata, & Chen, 2014; NICHD, 2000; Raikes, 2017; Stevenson, 2019). According to the work of Stevenson in 2019, individual states reported two reasons for assessing school readiness: (1) to monitor statewide levels of school readiness (seven of the 29 states) and (2) to guide instruction and practice on an individual child level while also screening for development delays (remaining 22 states). Taking into consideration a child’s development and life experiences, a kindergarten readiness score should be considered a ‘snapshot’ and not be

used in isolation. The readiness score combined with additional assessment better determines how best to provide learning opportunities for young students (Stevenson, 2019).

Identifying Developmental Delays

Often the purpose of assessment is to identify areas of developmental delay to provide appropriate intervention, services, and supports. Research shows systematic screenings can lead to earlier identification of children who need early intervention, including special education services. Identification and early intervention lead to improved outcomes for children at risk for a developmental delay or other identified disability. Early and systematic screening has potential to identify delays in all domains of development, including social-emotional behavior, vision and hearing, motor skills and coordination, cognitive abilities, and language and speech. Identifying developmental delays and causes provides the opportunity for specific interventions and supports; therefore, the task of identifying delays is essential in meeting instructional needs of students in early intervention (Acar et al., 2014; Daily et al., 2010; Vitrikas et al., 2017; Zucker, 2010). Children learn to complete a variety of tasks at different times throughout their development, promoting growth in skills and enabling students to progress through the developmental domains identified as part of kindergarten readiness. The different rates of progress require assessment tools necessary to target a range of those domains (Acar et al., 2014).

Developmental Profile™ 3 (DP™ -3)

It is essential to understand the Developmental Profile™ 3 assessment protocol to evaluate outcomes and measures of the study. The Developmental Profile 1 was initially drafted in 1971 based on The Binet-Simon Scale and Edgar Doll's Vineland Social Maturity Scales (Vineland™). The Binet-Simon Scale was used to measure a child's "mental age" by assessing

the completion of tasks asked of the child. In contrast, the Vineland™ measured social maturity or social competence in individuals from birth to adulthood. The intent of the Binet-Simon Scale was determining eligibility for special education services; however, over time, the assessment was also used to measure intelligence.

The current assessment, the Developmental Profile™ - 3, provides general development scales and scale scores in the following areas through the administration of a 180-item protocol:

- Physical: large- and small muscle coordination, strength, stamina, flexibility, and sequential motor skills.
- Adaptive Behavior: the ability to cope independently with the environment—to eat, dress, work, use modern technology, and take care of self and others.
- Social-Emotional: interpersonal skills, social and emotional understanding, functional performance in social situations, and how the child relates to friends, relatives, and adults.
- Cognitive: intellectual abilities and skills prerequisite to academic achievement.
- Communication: expressive and receptive communication skills, including written, spoken, and gestural language (Alpern, 2017; Kuebler, n.d.).

The DP™ -3 meets federal standards for evaluating children and determining eligibility for special education as the five scales match the five domains specified in IDEA for assessing developmental delays. The norms were established from a sample of 2,216 typically-developing children, representative of the United States population in regards to ethnicity, geography, and socioeconomic status. Score presentations include standard scores, percentile ranks, stanines, age equivalent and descriptive ranges. DP™ -3 is one way to recognize the developmental strengths and weaknesses of early childhood. The norm-based standard scores allow for the comparison

among peers, designing interventions that meet individual needs and monitoring progress (growth) over time (Alpern, 2017; Kuebler, n.d.).

Early Intervention Learning Environments

The United States Department of Education (ED) defines a “regular early childhood program” (inclusive setting) as one including a majority of typically-developing children or those who are not receiving special education services. Inclusive programs are not limited to early intervention classes offered by public school systems, private schools, or independent child development or childcare centers (2017).

Since the early 1970s, the idea of mainstreaming or serving students in an inclusive setting was raised when the Education for the Handicap Act was first established. Then in the early 1990s, inclusion was regarded as the primary service alternative for children with disabilities, and by the early 2000s, inclusion with typically developing peers had become a mainstay in the field of early childhood special education. Efforts to provide services in an inclusive setting was a shift for “traditional” special education programs but continues to move forward (Allen, Benning, & Drummond, 1972; Bailey, McWilliam, Buyusse, & Wesley, 1998 as cited by Sansone, 2012).

In 2002, Sansone examined developmental outcomes connected to educational services provided to students in inclusive and self-contained early intervention programs. The growth of 31 special education students, nine from an inclusive setting and twelve from a self-contained environment, was investigated. Students were matched by chronological age and classification with growth measured utilizing the Brigance Diagnostic Inventory of Early Development™. Post-assessment measured gross motor skills, fine motor skills, speech/language skills, and

general knowledge with results showing a significant difference between the two groups on gross motor for the inclusive setting but no significant differences in other skill achievements.

Recent research shows a more positive growth outcome for students in an inclusive setting; positive outcomes are evident for students with and without disabilities. Due to research, policymakers and school system administrators continue to identify inclusion as the first service alternative for young children with disabilities (American Academy of Pediatrics, 2007; Strain, 2017; ED & OSERS, 2017). The Division for Early Childhood (DEC) and the National Association for the Education of Young Children (NAEYC) released a joint statement recognizing one way of achieving implementation of services and supports for students with disabilities in a general education preschool by blending general education and special education early childhood programs (2015).

“Early childhood inclusion embodies the values, policies, and practices that support that right of every infant and young child and his or her family, regardless of ability, to participate in a broad range of activities and contexts as full members of families, communities, and society” (DEC/NAEYC, 2015, pg.2).

Inclusion

"All young children with disabilities should have access to inclusive high-quality early childhood programs where they are provided with individualized and appropriate supports to enable them to meet high expectations" (OSERS, 2017). The Individuals with Disabilities Education Improvements Act (IDEA) states school districts must ensure children with disabilities, ages three – 21, are educated with children without disabilities to the maximum extent possible, the student’s least restrictive environment (LRE). IDEA stresses a strong preference for placement of young children with disabilities in settings with typically-

developing, age-appropriate peers (2004). In September 2015, U.S. Departments of Health and Human Services and the U.S. Department of Education issued a policy statement to support the IDEA. The joint statement promotes inclusion in early childhood programs by setting a vision on the issue and providing recommendations to states, local educational agencies (LEAs), schools, and public and private early childhood programs. The statement includes reference to scientific basis for benefits of inclusion by stating the following:

(a) children's growth and learning are related to their peers' skills and the effect are most pronounced for children with disabilities (b) positive outcomes are achieved when children with disabilities are included several days per week in social and learning opportunities with their typically-developing peers and (c) typically-developing children show positive development, social, and attitudinal outcomes from inclusive experiences.

In addition, a Dear Colleague Letter from the United States Department of Education reaffirms the commitment to inclusive preschool education programs for children with disabilities and to reiterate the least restrictive environment (LRE) requirements in section 612(a)(5) of IDEA are fully applicable to placement of preschool children with disabilities (Barton, n.d.; Barton & Smith, 2015; IDEA, 2004; OSERS, 2017; HHS & ED, 2015).

Positive outcomes increase for children with and without disabilities in a high-quality inclusive setting, including social and communication skills and academic achievement. Research has shown high-quality early intervention in an inclusive environment has benefits for all children. The Educational Resources Information Center (ERIC) published a compilation of research regarding the integration of children with disabilities into preschool. The research includes studies post-1990; nonetheless, research that still supports present-day inclusive practices.

Appropriateness for Students with Disabilities

A portion of research regarding early intervention programs, including students with disabilities, supports the belief that children's disabilities prevent them from taking advantage of the experiences promoting typical child development. More recent research refutes the validity of such hypotheses. One study of inclusive programs reported children with disabilities who participated in an inclusive program revealed higher levels of social play and more age-appropriate social interactions. Students were also more likely to initiate interactions with peers and exhibited more advanced play than students in an early intervention program serving only special education students. Students with disabilities in inclusive programs experienced growth in language, cognitive, and motor development comparable to students who participated in the special education classroom and in inclusive settings than they do in self-contained classrooms. The contrary to this research states students with disabilities in an inclusive program still engage more in autonomous play, participate less in group play, and are chosen as playmates less often than typical peers (Fewell & Oelwein, 1990; Peck et al., 1993, p.39-64, p.249-270 as cited by Diamond, Others, & ERIC, 1994).

Appropriateness for Students with Without Disabilities

A number of studies suggest typical peers also benefit from inclusive early intervention programs. Typically-developing children who participate in inclusive programs show developmental growth comparable to their peers in non-inclusive programs. Both educators and parents have confidence that inclusive programs provide additional benefits for children without disabilities. Parents reported children in inclusive programs demonstrated less prejudice and stereotypes and were more responsive and helpful than children who were not exposed to students with disabilities. Teachers reported students without disabilities in inclusive programs

developed an increased awareness for needs of others, even for those students with the most significant disabilities. Perceptions reported by educators and parents emphasize potential social benefits of inclusive early intervention programs for students with and without disabilities (Giangreco et al., 1993; Odom & McEvoy, 1988; Peck et al., 1992 as cited by Diamond, Others, & ERIC, 1994).

Barton makes several statements in her presentation to education administrators and teachers in support of inclusion in early intervention classrooms. Her research on inclusive practice shows children's growth and learning are associated with their peers' skills and the effects being most noticeable for children with disabilities (2019). Researchers have debated that the quality of education delivered in the educational environment of early intervention is directly related to academic success and students with more significant disabilities have higher scores on some assessments, specifically language, than children in special education only (self-contained) settings. Considerable effects are seen across all outcome measures for children who are enrolled in inclusive environments (Barton, n.d.; Modeste, 2016).

Students with Disabilities (SWD)

Agreement is evident regarding the goal of early intervention or preschool; it is to prepare children for kindergarten; however, there continues to be debate whether programs are meeting goals for all children or only a subset. A large volume of research and policy attention is given to the variety of preschool outcomes regarding a child's race/ethnicity, gender, disability status, and socioeconomic status. Approximately 626,206 preschool children in the United States attending either a public or private funded early intervention program of some type; an estimated 15% of those children have at least one developmental delay. Nevertheless, only a handful of studies have considered the benefits of those programs for children with disabilities (Ansari, 2018;

Bloom & Weiland, 2015; Im et al., 2019; Phillips & Meloy, 2012; Vitrikas et al. 2017; Weiland, 2016).

Zucker stated, "Children with special needs on all levels need to be provided diagnosis and remediation early in their educational lives" (2010, p.10). Services and supports provided as part of remediation or early intervention differ due to disabilities resulting from physical, cognitive, and behavioral delays. Early intervention is most effective for children who have risk factors for developmental delays and are designed to diminish factors placing children at risk of adverse outcomes (RAND, 2005b; Sira, Maine, & McNeil, 2018; Vitrikas et al. 2017).

Based on the Perry Preschool Project, James Heckman declared high-quality early childhood programs are linked to reduced retention rates in school and the reduction of needed special education services; he also discovered 50% of the identified achievement gaps evident at the end of high school existed before children started kindergarten (Gayden-Hence, 2016). His work provides data to back the belief that intervention needs to be implemented early and consistently to assure the best opportunity for success in academics as well as social interactions. Additional studies reveal children who receive early intervention services experience improvements in cognitive and academic performance, and coordinated intervention efforts can provide the highest rate of inclusion into the mainstream and educational achievement (Vitrikas et al. 2017; Zucker, 2010). Morgan gathers several meta-analyses that have shown participation in preschool can enhance cognitive development; one analysis published in 2010 indicated participating in an early intervention program improved cognitive outcomes, social skills, and school progress (2019).

In contrast, the American Academy of Family Physicians (AAFP) has determined the research outcomes concerning participation in early intervention varies making it unpredictable;

this can be further defined as a "considerable variation among study findings and lack of coherence" (Vitrikas et al. 2017, p. 37). The inconsistency of the research has led to a B rating for early intervention services for children identified with a developmental delay for "key recommendations for practice" (AAFP/SORT, 2017; Vitrikas et al., 2017). Strength-of-Recommendation Taxonomy (SORT) tables are shown in Figures 2 and 3.

Figure 2

SORT: The Strength-of-Recommendation Taxonomy Table 1

Strength-of-Recommendation Grades

Strength of recommendation	Basis for recommendation
A	Consistent, good-quality patient-oriented evidence
B	Inconsistent or limited-quality patient-oriented evidence
C	Consensus, disease-oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Figure 3

SORT: The Strength-of-Recommendation Taxonomy Table 2

Assessing Consistency of Evidence Across Studies

Consistent	Most studies found similar or at least coherent conclusions (coherence means that differences are explainable). <i>or</i> If high quality and up-to-date systematic reviews or meta-analysis exist, they support the recommendation.
Inconsistent	Considerable variation among study finding and lack of coherence <i>or</i> If high quality and up-to-date systematic reviews or meta-analysis exist, they do not find consistent evidence in favor of the recommendation.

“Classic, long-term evaluations of early childhood programs and theories from the economic and developmental literatures on skill-building argue that preschool effects are likely to persist over time because these programs can provide children with the foundational skills necessary for later school success” (Ansari, 2018, p.953-54). Children with disabilities are still children who need opportunities to be part of a learning environment and program where they have access to rich experiences, learn in the context of play and everyday interactions, and engage alongside peers with and without disabilities (Barton, n.d.; Barton & Smith, 2015; IDEA, 2015).

Funding Sources and Implications

Early intervention through preschool participation results in more school-ready children; early preparation allows schools and communities to reap financial short- and long-term benefits. School readiness leads to a school system’s capacity to reduce funding allocations for special education and remediation; communities see long-term effects of lowering future crime and unemployment rates. Thus, states interpret providing access to preschool programs as a long-term economic investment in school readiness, student achievement, and future workforce; this has led to a number of industrialized nations increasing the opportunities for young children to participate in early intervention or preschool programs (Morgan, 2019; Parker, Atchison, & Workman, 2016).

In 2015, 67 percent of children age four who were not enrolled in kindergarten were enrolled in a preschool program. Lipsey, Farran, and Durkin reference a “white paper” released by the Executive Office of the President of the United States in 2014 stating “high-quality early education narrows achievement gaps, boost adult earnings and results in savings of \$8.60 for every 41 cents spent” (2018, p.155). The result of this statement was the allocation of millions of

dollars to increase preschool programs by the United States Department of Education; state funding of preschool programs across the 50 states and the District of Columbia increased by nearly \$755 million, or 12 percent over the previous years (Parker, Atchison, & Workman, 2016). The increase in preschool funding was intended to provide school systems with means to serve a more significant number of at-risk children with early intervention through preschool programs. The same emphasis on preschool programs is evident at the national level with the passing of the Every Student Succeeds Act (ESSA) in 2015. The ESSA increased funding options for early intervention through three sources: Title I, Title II, and Preschool Development Grants. Utilizing Preschool Development Grant funds allows school districts to strengthen the transition from preschool to kindergarten programs (ED, 2015; Parker, Atchison, & Workman, 2016).

Studies continue to support findings that preschool services produce academic, social and economic benefits: Zucker's research notes a societal savings of \$30,000.00 to \$100,000.00 per participating child (Lipsey et al., 2018; Morgan, 2019; Parker, Atchison, & Workman, 2016; Zucker, 2010). Shriver, the senior vice president for Save the Children's U.S. Programs and Advocacy, states the following:

Investing in high-quality early childhood education is one of the most effective ways to break the pervasive cycle of poverty and ensure equal opportunity for all families in America...effective pre-school programs are a long-term investment in our nation's future and our most precious resource: our children. They provide the foundation and set the course for a child's lifelong learning and success (NIEER, 2019).

The National Assessment of Educational Progress (NAEP) found a positive correlation between the amount of money allocated to preschool programs and increased reading and math scores.

The correlation provided another reason to emphasize the statement by Modeste, “finding ways to utilize creative strategies must be used in our communities to ensure all students get the opportunity to receive a quality prekindergarten education to allow them to enter prekindergarten eager and ready to learn” (2016, p. 4). Several studies have revealed the benefits occurring later in life of providing children a high-quality early intervention experience, including higher income levels and a more successful university experience. The cost of not providing an early intervention experience can be significant (Morgan, 2019).

“NEA urges states to make high-quality early childhood education programs a priority and consider them an integral part of the education continuum. States should encourage and support public schools in their efforts to provide early childhood programs. Funding for new or expanded early childhood programs in public schools should come from new funding sources and be a shared responsibility of national, state, and local governments” (2008).

Summary

The presentation of research provides theories that preschool programs can produce positive effects on various target outcomes before kindergarten entry and throughout a child’s school career. Focusing on kindergarten/school readiness, assessment, early intervention environments, benefits for students with disabilities, and funding sources and implications still leave questions about the nature of the effects and of who benefits most from early intervention programs. Questions are often asked due to focus on necessary pre-academic skills and long-term impact, not overall influences on cognitive and behavioral development (i.e., complex language skills, mathematics, self-regulation, and social skills) or kindergarten readiness (Ansari, 2018; Lipsey et al., 2018; Zucker, 2010). "Infant and preschool programs provide a unique

experience for children as they begin the developmental journey to acquire the skills and subsets they need to succeed in kindergarten..." (Zucker, 2010, p.1).

Chapter 3 describes research methods utilized to gather and examine data for the study. Data were collected to demonstrate growth for students enrolled in one district's early intervention programs; the study could reveal effectiveness of preschool programs preparing students for kindergarten readiness. A positive growth measure could positively influence school district efforts to increase supports in early intervention by proving the value of the programs.

Organization of the Study

Chapter 1 encompasses introduction, statement of the problem, purpose of the study, research questions, significance of the study, definition of terms, study limitations, scope and delimitations, and assumptions. Chapter 2 includes review of interrelated literature and research focusing on the importance of early intervention, screening and intervention for students with disabilities, and different program options for early intervention. Methodology and procedures used to collect data are defined in Chapter 3. Chapter 4 provides results for analysis of data and study findings. Chapter 5 summarizes study and its findings, ensuing conclusions, a discussion, and future study recommendations.

Chapter 3: Research Design and Methods

The purpose of this quantitative study was to determine the effect of early intervention participation on kindergarten readiness as measured by the Developmental Profile™ 3 (DP™ - 3). The study was a quasi-experimental design measuring growth during a six-month timeframe by administering a pre-assessment at the beginning of the school year and a post-assessment after six months of early intervention participation. Administering the DP™ -3 on two separate occasions allowed growth in all five domains and the overall general development to be measured.

This chapter defines the design, methods, and procedures used to complete the study. Methodology includes the research questions and null hypotheses, population and student sample, description of instrumentation, data collection, and data analysis, including descriptive statistics.

Research Question(s) and Null Hypotheses

1. Is there a significant difference in the pre-assessment and post-assessment overall general development score for students enrolled in the early intervention program?
H₀1: There is no significant difference in the pre-assessment and post-assessment on the overall general development score for students enrolled in the early intervention program.
2. Is there a significant difference in the pre-assessment and post-assessment scores in the five developmental domains for students enrolled in the early intervention program?
H₀2: There is no significant difference in the pre-assessment and post-assessment in the five developmental domains for students enrolled in the early intervention program.
3. Is there a significant difference between general education and special education student growth scores in the five developmental domains?

H₀₃: There is no significant difference between general education and special education student growth scores in the five developmental domains.

4. Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly different growth for overall general development than students with disabilities who participated in the special education classroom?

H₀₄: There is no significant difference in growth for overall general development for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention than students with disabilities who participated in the special education classroom.

5. Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly different growth in the five developmental domains than students with disabilities who participated in the special education classroom?

H₀₅: There is no significant difference in the growth in the five developmental domains for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention than students with disabilities who participated in the special education classroom.

6. Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth for overall general development than general education students in the same classroom?

H₀6: There is no significant difference in growth for overall general development for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) than general education students in the same classroom.

7. Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth in the five developmental domains than general education students in the same classroom?

H₀7: There is no significant difference in growth for overall general development for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) than general education students in the same classroom.

8. Is there a significant difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years?

H₀8: There is no significant difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years.

9. Is there a significant difference on the post-assessment for the five developmental domains for students with disabilities when comparing students who were enrolled in the early intervention program for the current year or multiple years?

H₀9: There is no significant difference in the post-assessment for the five developmental domains for students with disabilities compared to students who were enrolled in the early intervention program for the current year or multiple years.

10. Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development?

H₀10: There is no significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development.

11. Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment across the five developmental domains?

H₀11: There is no significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment across the five developmental domains.

Population and Sample

Population of the study was 286 students ages four or five who were enrolled in one of the district's preschool/early intervention programs for the 2019 – 2020 school year. Of the population, 221 were identified as typical peers (general education), 65 were identified as having a disability (SWD) as defined by state and federal criteria. Early childhood programs were housed in seven different locations throughout the district: five elementary schools, an early learning center, and a community, multi-purpose facility, including Title I, Voluntary Preschool (VPK), Special Education (619), Head Start collaborative, and self-funded early learning programs. Demographics of preschool programs are presented in Figures 4, 5, and 6.

Figure 4

Total Preschool Population

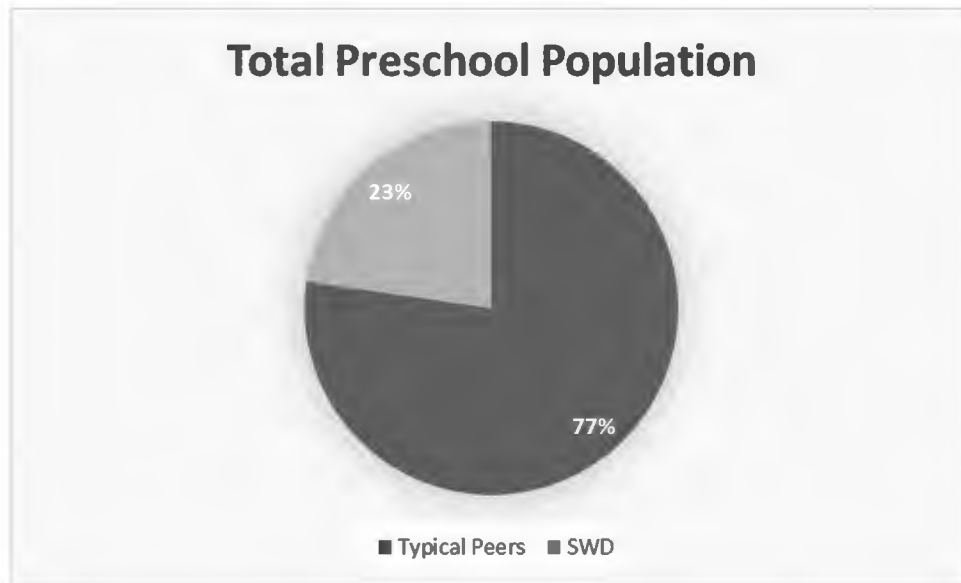


Figure 5

Students with Disabilities (SWD) by Eligibility

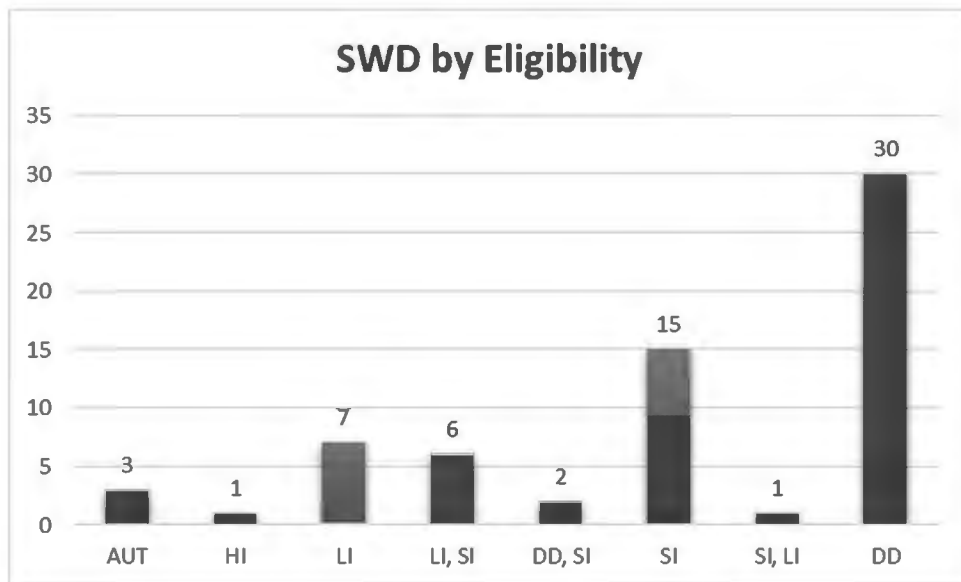
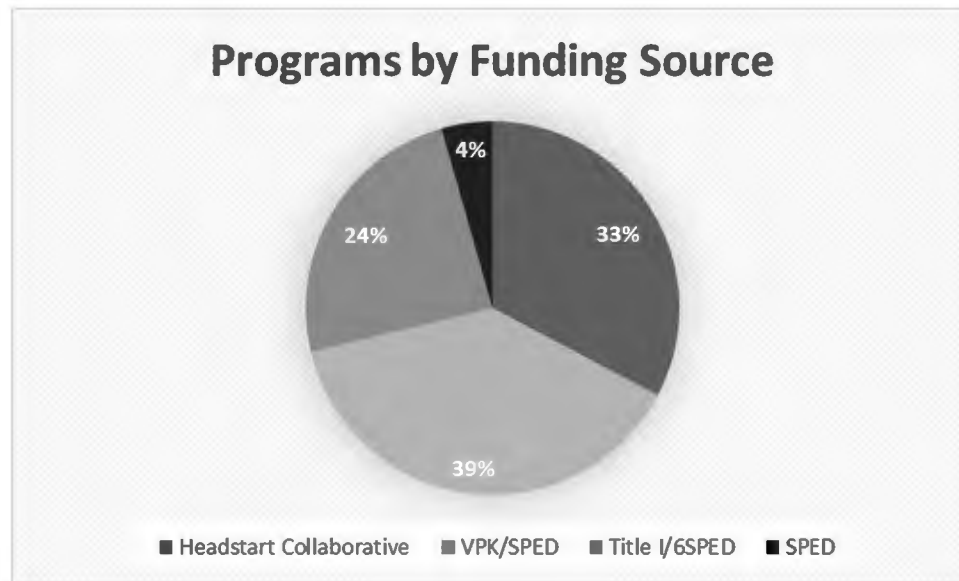
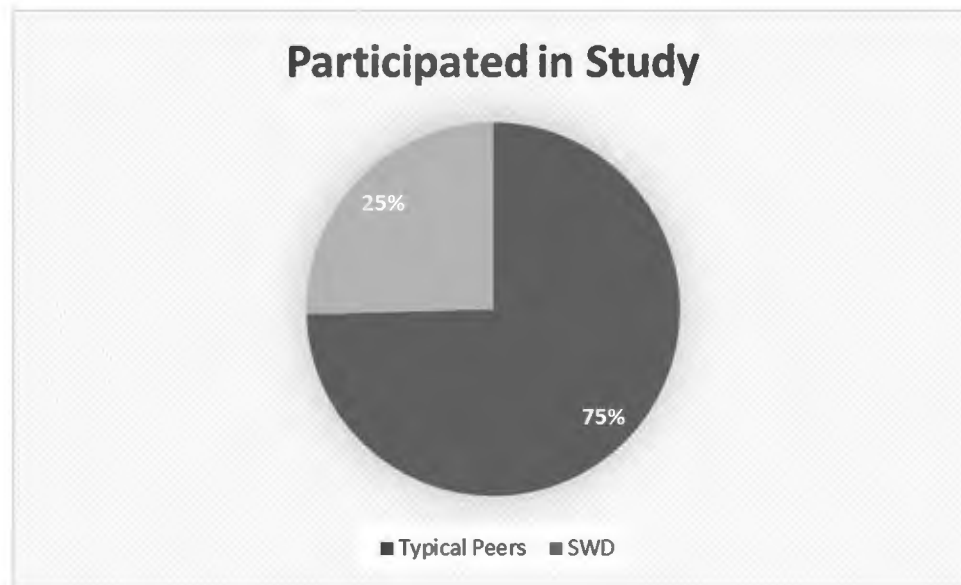


Figure 6*Programs Population by Funding Source*

Research participants were general education and special education students whose parents or guardians gave written consent to be included in the study. (See Appendix C) Research participants included all genders, ethnicities, and socioeconomic groups enrolled in the program; the only exclusionary factor was the date of enrollment or un-enrollment. For inclusion in the study, participants were enrolled in one of the early intervention classes located at the early learning center or housed in an elementary school during both the pre-assessment and post-assessment window. The sample of the study was 113 students: 83 typical peers and 30 students with disabilities. Demographics of the study sample are presented in Figure 7 and Table 1.

Figure 7*Study Sample Participants***Table 1***Demographic Profile for Participant Programs*

Classrooms	(N)	(n)	General Education	SWD
Class 1	19	15	18	1
Class 2	15	14	11	4
Class 3	19	16	18	1
Class 4	12	6	7	5
Class 5	12	12	8	4
Class 6	16	15	13	3
Class 7	12	4	7	5
Class 8	13	6	8	5
Class 9	13	12	7	6
Class 10	11	4	6	5
Class 11	11	9	8	3

Instrumentation

Developmental Profile™ - 3 Assessment

Student growth data were collected using the Development Profile™ 3. The DP™ - 3 is a standardized, norm-based measure of child development. Version 3 maintains continuity of earlier versions by joining the history and psychometric standards in test development. It was designed to assess five key developmental domains across a significant age range and has been accepted and used in psychology and education (Alpern, 2017).

The DP™ - 3 assessment was already utilized by the selected district to determine kindergarten readiness for a select group of students; for the study, the researcher obtained permission from the district to assess all students and for results to be included in the research.

Description

The DP™ - 3 offers five scales or domains, each containing 34 to 48 items, designed to measure the development and functioning of a child from birth through age 12. Domains include physical, adaptive behavior, social-emotional, cognitive, and communication. The DP™ - 3 assesses a comprehensive array of skills, from severe delay to above-average ability, and is designed to be administered as an interview of the child's parent or caregiver (includes teacher). The assessment takes approximately 20 to 40 minutes to complete.

Administration

Due to the number of students and classrooms involved in the study, instructions and guidance were provided to all early intervention teachers on completing the DP™ - 3 with students on the roster. The researcher was available throughout the completion of the assessment to provide further guidance, answer any questions, or assist with administering the assessment; this instruction and available support were intended to ensure reliable assessment.

The DP™ - 3 was administered using the Interview Form with the teacher or instructional assistant acting as the assessor and answering “yes” or “no” in regards to a student’s ability to perform a task referenced in the protocol. Age of the students participating in the study dictated where to start the assessment; for students aged 4-0 to 5-1, assessors began on item number 16 on each domain continuing through the administration until a basal and ceiling were established. The basal and ceiling were used to eliminate the need to administer all 180 items; “start” and “stop” points, as defined in the testing protocol, ensured only age-appropriate questions are examined. (See Appendix D)

Parents or guardians were interviewed by the researcher or designee if assessor was unable to complete assessment through observations. The parent or guardian was interviewed by the researcher or designee via phone, allowing necessary data for the student to be gathered.

Identical administration procedures were utilized for both the pre- and post-assessment administered by early intervention teachers, instructional assistants, the researcher, or via a parent or guardian interview. Pre-assessment was completed during the first two weeks of September then post-assessment was completed the last two weeks of February. The assessment timeline allowed for six months of instruction between assessments.

Scoring

Each student pre- and post-assessment was scored by the researcher or a designated member of the district’s special education department using the DP™ - 3 scoring and interpretation software provided by the district.

Reliability and Validity

The DP™ - 3 has gone through numerous tests to measure reliability and validity. Two types of reliability are revealed in the research: internal consistency and test-retest data and

several tests of validity, including content, construct, and discriminant validity (Alpern, 2007; Bauman, 2019; Kuebler, n.d.).

The internal consistency of the DP™ - 3 was measured by the split-half method and test-retest principle across all ages and demographics. Internal consistency results identified a correlation of more than .80, with most being .90 or more, for each age represented. The correlations were proven good, if not excellent, and indicated strong reliability for the DP™ - 3.

Content validity utilized item content to evaluate areas of interest. The DP™ - 3 established content validity with an increase of raw scores as the child's age increases, due to expected changes in behavior. The increase confirmed the assessment's ability to measure the developmental domains correctly. Construct validity studied the structural components of the five scales by using inter-scale correlations, item response theory analysis, and factor analysis. In addition, construct validity was confirmed through a relationship amid other psychological exams and the DP™ - 3. Discriminant validity means the DP™ - 3 recognized the difference between typically-developing children and those who exhibit characteristics associated with developmental delays. The sample size of 398 children, when compared with the standardization sample, showed a difference that was both meaningfully and statistically different (Bauman, 2019).

Even though the authors have reduced the age increments in version three, a concern is the DP™ - 3's sensitivity to developmental gain due to the age groupings for the assessment. Ages are grouped in increments of two years with as few as eight items per area (Alpern, 2007).

Data Collection and Procedures

Permission to conduct the study, including permission to administer assessment and collect data, was attained from the Institutional Review Board (IRB) at Milligan College and

selected district before beginning the study. (See Appendix A and B) Methods for ethical protections of participants were followed prior to gathering any data. Identifying information was collected but not utilized in order to safeguard the names of students, teachers, and program sites to ensuring confidentiality. Assessment and data collection protocols did not present any physical or psychological risks to participants.

The researcher met with all early intervention teachers who had the potential to participate in the study before the first day of school. The protocol for the study was shared and described in detail, written consent was explained, and a plan of action established to ensure all parents and guardians were informed prior to consent.

During the school and class open house, the study was described for all families present, including the need for written consent and the ability to opt-out. Parents and guardians who did not attend the event were provided information by the student's teacher during individual home visits. Signed consent forms, including opt-outs, were picked up from individual classrooms by the researcher prior to the two-week window allocated for assessment completion.

After the initial two weeks of staggered attendance for all early intervention students in the district, the researcher delivered DPTM - 3 protocols to each teacher individually who would be serving role of assessor. Instructions were provided on how to correctly complete the DPTM - 3 for each student, how to store protocols after completion, and timeline for completion.

Assessors were given a two-week window to complete the protocols using observations of each student. At the end of the two-week window, protocols were either delivered to the researcher by each assessor or picked up by the researcher; student protocols were stored in a secure location only accessible to the researcher. This procedure was used for both the pre- and post-assessment.

Scores for the pre- and post-assessment were entered on a spreadsheet only accessible to the researcher. Scores were entered into SPSS statistical software for both the pre- and post-assessment; names of students were removed and numerical codes used. Once both sets of data were collected, identifiers were removed to prevent re-identification, and individual student protocols were stored in a secure location only accessible by the researcher or by the student's teacher upon formal request.

Data Analysis

The key component for DPTM - 3 interpretation is the standard score; it is considered the most satisfactory type of derived score. Standard score was used as a common metric for the study to permit comparison among pre- and post-assessment, different groups of students, and benchmark norms. Normalized standard score value corresponds to the same percentile rank for each scale. Percentile rank for DPTM - 3 standard scores are presented in Figure 8.

Figure 8

Developmental ProfileTM 3 Percentile Rank for Standard Scores

Percentile Rank and Stanine Equivalents for DP-3 Standard Scores								
Standard score	Percentile rank	Stanine	Standard score	Percentile rank	Stanine	Standard score	Percentile rank	Stanine
>140	>99.6	9	110	75	6	79	8	2
140	99.6	9	109	73	6	78	7	2
139	99.5	9	108	70	6	77	6	2
138	99	9	107	68	6	76	5	2
137	99	9	106	66	6	75	5	2
136	99	9	105	63	6	74	4	2
135	99	9	104	61	6	73	4	2

Continued.

Developmental Profile™ 3 Percentile Rank for Standard Scores Continued

Percentile Rank and Stanine Equivalents for DP-3 Standard Scores								
Standard score	Percentile rank	Stanine	Standard score	Percentile rank	Stanine	Standard score	Percentile rank	Stanine
134	99	9	103	58	5	72	3	1
133	99	9	102	55	5	71	3	1
132	98	9	101	53	5	70	2	1
131	98	9	100	50	5	69	2	1
130	98	9	99	47	5	68	1	1
129	97	9	98	45	5	67	1	1
128	97	9	97	42	5	66	1	1
127	96	9	96	39	5	65	1	1
126	96	9	95	37	4	64	1	1
125	95	8	94	34	4	63	1	1
124	95	8	93	32	4	62	1	1
123	94	8	92	30	4	61	0.5	1
122	93	8	91	27	4	60	0.4	1
121	92	8	90	25	4	59	0.3	1
120	91	8	89	23	4	58	0.3	1
119	90	8	88	21	3	57	0.2	1
118	88	8	87	19	3	56	0.2	1
117	87	7	86	18	3	55	0.1	1
116	86	7	85	16	3	54	0.1	1
115	84	7	84	14	3	53	0.1	1
114	82	7	83	13	3	52	0.1	1
113	81	7	82	12	3	51	0.1	1
112	79	7	81	10	3	50	<0.1	1
111	77	7	80	9	2			

Qualitative descriptions of a child's functioning provide an estimation of their abilities relative to typical, same-age peers. Interpretive score ranges are presented in Figure 9.

Figure 9

Developmental Profile™ 3 Descriptive Categories

Descriptive Categories for the DP-3	
Descriptive category	Standard score range
Well Above Average	>130
Above Average	116 - 130
Average	85 – 115
Below Average	70 - 84
Delayed	<70

All data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Analysis for each set of research questions was as follows:

1. A paired samples t-test was used for research question 1 to assess the pre- and post-assessment growth for overall general development for students who were enrolled in the early intervention program.
2. A paired samples t-test was used for research question 2 to assess the pre- and post-assessment growth for each of the five developmental domains (physical/motor, adaptive, SEL, cognitive, and communication) for students who were enrolled in the early intervention program.
3. An independent samples t-test was used for research question 3 to assess differences in general education and special education students' growth scores in the five developmental domains.

4. An independent samples t-test was used for research question 4 to assess the growth for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) and those who participated in the 100% special education classroom of early intervention for overall general development.
5. An independent samples t-test was used for research question 5 to assess the growth for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) and those who participated in the 100% special education classroom of early intervention for each developmental domain (physical/motor, adaptive, SEL, cognitive, and communication).
6. An independent samples t-test was used for research question 6 to assess the growth for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) and for general education students in the same classroom for overall general development.
7. An independent samples t-test was used for research question 7 to assess the growth for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) and for general education students in the same classroom for each developmental domains (physical/motor, adaptive, SEL, cognitive, and communication).
8. An independent samples t-test was used for research question 8 to assess differences in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years.
9. An independent samples t-test was used for research question 9 to assess differences in the post-assessment for the five developmental domains (physical/motor, adaptive, SEL,

cognitive, and communication) for students with disabilities who were enrolled in the early intervention program for the current year or multiple years.

10. A chi-square goodness-of-fit test was used for research question 10 to assess differences in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development.

11. A chi-square goodness-of-fit test was used for research question 11 to assess differences in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for the five developmental domains (physical/motor, adaptive, SEL, cognitive, and communication).

All data were analyzed at .05 level of significance.

Summary

Methodology used in the quantitative, quasi-experimental study was defined in this chapter. Following a brief introduction, research questions with null hypotheses, population, and study sample were presented. In addition, instrumentation was described and process for data collection and analysis were defined.

Chapter 4: Data Analysis and Findings

The purpose of the quantitative study was to determine effects of early intervention participation on kindergarten readiness by measuring growth during a six-month timeframe for a single school year. Participants in the study were enrolled in one of the programs for four- and five-year-olds in one selected school district in Upper East Tennessee. The data were retrieved from eleven early intervention programs located in six locations, including programs located in elementary schools throughout the district and the district's early learning center. The study consisted of 113 students who were assessed in September and February using the DPTM - 3. Participant assessment was completed through observation by the participant's teacher or by interviewing the parent or guardian. This chapter details the findings resulting from the data analysis of the eleven research questions used in the study.

Demographic Data

Population for the study consisted of students enrolled in early intervention programs in the Upper East Tennessee school district for the 2019-2020 school year. Research participants included all genders, ethnicities, and socioeconomic groups enrolled in the program; however, specific demographic data were not collected as part of the study. The only demographic data included the number of years a student was enrolled in an early intervention program in the school district, type of learning environment or classroom, and the student's special education eligibility.

The sample included 113 students enrolled in one of the early intervention programs during the pre-assessment and post-assessment administration window. Thirty students from the 113 were identified as having a disability (SWD), 27% of the study population. Seventy-five percent of the students had only been enrolled in an early intervention program for the current

school year, while 16% had been enrolled for two years, and 9% for three years. Only nine of the students who participated in the study were enrolled in a special education learning environment or classroom; the remaining 80% were enrolled in a general education (inclusive) program.

Findings

Research Question 1

Research Question 1: Is there a significant difference in the pre-assessment and post-assessment overall general development score for students enrolled in the early intervention program?

H₀1: There is no significant difference in the pre-assessment and post-assessment overall general development score for students enrolled in the early intervention program.

A paired samples t-test comparing the mean scores of overall general development pre- and post-assessment was conducted. The mean for the overall general development pre-assessment score was significantly lower ($M = 76.97, sd = 13.794$) than the mean for the overall general development post-assessment score ($M = 90.36, sd = 15.221$); $t(96) = -14.234, p = .001$. A significant difference between the pre- and post-assessment mean for overall general development was found; therefore, the null hypothesis was rejected. With a p-value of less than .05, results suggest participation in the early intervention program impacted the overall general development score of participating students. Cohen's *d* (effect size) was used to determine the size of difference. Cohen's *d* of .922 indicated a large difference in pre-and post-assessment mean scores for overall general development for participants who were enrolled in the early intervention program. Results are presented in Table 2.

Table 2*Paired Samples t-test for General Overall Development Pre- and Post-assessment*

Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Pre-assessment	76.97	13.794	96	-14.234	.001*	.922
Post-assessment	90.36	15.221				

Note. * $p < .05$ **Research Question 2**

Research Question 2: Is there a significant difference in the pre-assessment and post-assessment scores in the five developmental domains for students enrolled in the early intervention program?

H₀2: There is no significant difference in the pre-assessment and post-assessment scores in the five developmental domains for students enrolled in the early intervention program.

A paired samples t-test comparing the mean scores of the five developmental domains for pre- and post-assessment was conducted. The mean for pre-assessment scores were significantly lower than the mean for post-assessment scores in all five developmental domains: Physical pre-assessment ($M = 78.96$, $sd = 12.748$), post-assessment ($M = 87.02$, $sd = 14.055$); $t(103) = -9.059$, $p = .001$, adaptive pre-assessment ($M = 86.57$, $sd = 12.943$), post-assessment ($M = 92.20$, $sd = 13.350$); $t(102) = -5.951$, $p = .001$, social-emotional pre-assessment ($M = 84.52$, $sd = 11.650$), post-assessment ($M = 96.87$, $sd = 12.726$); $t(99) = -11.585$, $p = .001$, cognitive pre-assessment ($M = 80.84$, $sd = 12.932$), post-assessment ($M = 95.50$, $sd = 16.262$); $t(99) = -13.259$, $p = .001$, and communication pre-assessment ($M = 82.48$, $sd = 13.220$), post-assessment ($M = 89.34$, $sd = 16.357$); $t(99) = -4.950$, $p = .001$. A significant difference between the means of all five developmental domains on the pre-assessment and post-assessment was found; therefore, the null hypothesis was rejected. With a p-value of less than .05, results suggest

participation in the early intervention program impacted the developmental domain scores for participating students. Cohen's *d* (effect size) was used to determine the size of the difference for each of the developmental domains. Cohen's *d* ranging from .428 to .988 indicated a moderate to large difference in pre-and post-assessment mean scores for developmental domains for participants who were enrolled in the early intervention program. Results are presented in Table 3.

Table 3

Paired Samples t-test for Five Developmental Domains Pre- and Post-assessment

Dev Domain	Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Physical	Pre-assessment	78.96	12.748	103	-9.059	.001*	.601
	Post-assessment	87.02	14.055				
Adaptive	Pre-assessment	86.57	12.943	102	-5.951	.001*	.428
	Post-assessment	92.20	13.350				
SocEmotional	Pre-assessment	84.52	11.650	99	-11.585	.001*	.613
	Post-assessment	92.20	13.350				
Cognitive	Pre-assessment	80.84	12.932	99	-13.259	.001*	.998
	Post-assessment	95.50	16.262				
Communication	Pre-assessment	82.48	13.220	99	-4.950	.001*	.461
	Post-assessment	89.34	16.357				

Note. * $p < .05$

Research Question 3

Research Question 3: Is there a significant difference between general education and special education students' growth scores in the five developmental domains?

H₀3: There is no significant difference between general education and special education students' growth scores in the five developmental domains.

An independent samples t-test comparing the mean scores of general education and special education students' growth scores in the five developmental domains was conducted. Even though the means for general education students were higher than the means for special education students in four of the five developmental domains, a significant difference between the means of those four developmental domains was not found. Data results are as follows: Adaptive SWD ($M = 3.91$, $sd = 10.570$), GenEd ($M = 6.13$, $sd = 9.319$); $t(101) = -973$, $p = .333$, social-emotional SWD ($M = 9.05$, $sd = 11.088$), GenEd ($M = 13.23$, $sd = 10.440$); $t(98) = -1.610$, $p = .111$, cognitive SWD ($M = 5.21$, $sd = 8.785$), GenEd ($M = 9.54$, $sd = 16.124$); $t(98) = -1.128$, $p = .262$, and communication SWD ($M = 4.14$, $sd = 8.901$), GenEd ($M = 7.49$, $sd = 14.795$); $t(100) = -.988$, $p = .326$. The same independent samples t-test did result in a significant difference between the means of general education and special education students' growth scores for the physical domain: SWD ($M = 2.88$, $sd = 8.279$), GenEd ($M = 9.61$, $sd = 8.759$); $t(102) = -3.345$, $p = .001$.

With a p-value greater than .05 in four developmental domains, results suggest no significant relationship between the growth for general education and special education students. Running Levene's test for homogeneity of variance with a large p-value also indicated no significant difference in variance between these two groups of students; therefore, equal variance was assumed. Cohen's d (effect size) was used to determine the size of the difference for each of the developmental domains. Cohen's d ranged from .223 to .388, indicating a small difference in general education and special education students' growth scores in four of the developmental domains.

Growth for the physical domain has a p-value of less than .05, suggesting participation in the early intervention program has a significant difference in growth for general education and

special education students. Running Levene's test for homogeneity of variance with a small p -value indicates equal variance could not be assumed. An effect size of .790 was determined using Cohen's d , indicating a large difference between mean of growth for the developmental domain.

Based on results, the null hypothesis was retained for four of the developmental domains: Adaptive, social-emotional, cognitive, and communication. The null hypothesis was rejected for the developmental domain of physical growth. Results are presented in Table 4.

Table 4

Independent Samples t-test on Growth Scores in the Five Developmental Domains

Dev Domain	Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
GrowPhysical	SWD	2.88	8.279	40	-3.449	.001*	.790
	GenEd	9.61	8.759				
GrowAdaptive	SWD	3.91	10.570	101	-.973	.333	.223
	GenEd	6.13	9.319				
GrowSocEmot	SWD	9.05	11.088	98	-1.610	.111	.388
	GenEd	13.23	10.440				
GrowCognitive	SWD	5.21	8.785	97	-1.128	.262	.333
	GenEd	9.54	16.124				
GrowComm	SWD	4.14	8.901	99	-.988	.326	.274
	GenEd	7.49	14.795				

Note. * $p < .05$

Research Question 4

Research Question 4: Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly

different growth for overall general development than students with disabilities who participated in the special education classroom?

H₀4: There is no significant difference in growth for overall general development for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention than students with disabilities who participated in the special education classroom.

An independent samples t-test comparing the mean scores of students with disabilities overall general development in the inclusion classroom and special education classroom was conducted. The mean for the overall general development for students participating in an inclusive classroom was higher ($M = 12.15, sd = 16.262$) than the mean for the overall general development for students participating in a special education classroom ($M = .00, sd = 1.264$); $t(30) = -1.807, p = .021$. A p-value of less than .05 was calculated; therefore, the null hypothesis was rejected. With a p-value of less than .05, results suggest a significant difference in growth for overall general development based on classroom type. Running Levene's test for homogeneity of variance with a small p-value also indicated a significant difference in variance between the classroom types; therefore, equal variance was not assumed. An effect size of 1.053 using Cohen's d was determined, indicating a large difference between means of growth in overall general development for students with disabilities in the inclusion and special education classrooms. Results are presented in Table 5.

Table 5*Independent Samples t-test on SWD Growth for Overall General Development*

Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
SPED	.00	1.265	30	-1.807	.021*	1.053
GenEd/Inclusive	12.15	16.262				

Note. * $p < .05$ **Research Question 5**

Research Question 5: Did students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention show significantly different growth in the five developmental domains than students with disabilities who participated in the special education classroom?

H₀5: There is no significant difference in the growth in the five developmental domains for students with disabilities who participated in the inclusion classroom (no more than 50% SWD on the roster) of early intervention than students with disabilities who participated in the special education classroom.

An independent samples t-test comparing the difference of mean scores of students with disabilities in the inclusion classroom and special education classroom for growth in the five developmental domains was conducted. Even though the means for students in the inclusion classroom were higher than the means for students in the special education setting in four of the five developmental domains, a significant difference between means of those four developmental domains was not found. Data results are as follows: Adaptive SPED ($M = -3.67, sd = 5.132$), GenEd/Inclusive ($M = 5.05, sd = 10.778$); $t(30) = -1.357, p = .189$, social-emotional SPED ($M = 8.00, sd = 2.828$), GenEd/Inclusive ($M = 9.16, sd = 11.663$); $t(22) = -.137, p = .892$, cognitive SPED ($M = 4.00, sd = 9.899$), GenEd/Inclusive ($M = 5.35, sd = 8.972$); $t(17) = -.200, p = .844$,

and communication SPED ($M = -7.00$, $sd = 1.414$), GenEd/Inclusive ($M = 5.32$, $sd = 8.525$); $t(19) = -1.995$, $p = .061$. The same independent samples t-test did result in a significant difference between the means of growth scores for the physical domain between the two classroom types: SPED ($M = -4.80$, $sd = 5.450$), GenEd/Inclusive ($M = 4.89$, $sd = 7.767$); $t(22) = -2.607$, $p = .016$.

With a p-value of more than .05 in four developmental domains, results suggest no significant difference in growth of those domains based on the classroom type. Running Levene's test for homogeneity of variance with a large p-value also indicates variances are equal across the two learning environments; therefore, equal variance was assumed. Cohen's d (effect size) was used to determine the size of difference for each of the developmental domains. Cohen's d ranged from .137 to 2.016, indicating a trivial to large difference between means of growth in four of the developmental domains.

Growth for the physical domain has a p-value of less than .05, suggesting a significant difference in growth for students in special education and general education/inclusive classroom. Running Levene's test of variance with a small p-value also indicates equal variance could not be assumed. An effect size of 1.444 was determined using Cohen's d, indicating a large difference between means of growth for this developmental domain.

Based on the results, the null hypothesis was retained for four of the developmental domains: Adaptive, social-emotional, cognitive, and communication. The null hypothesis was rejected for the developmental domain of physical growth. Results are presented in Table 6.

Table 6*Independent Samples t-test on SWD Growth for Five Developmental Domains*

Dev Domain	Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
GrowPhysical	SPED	-4.80	5.450	22	-2.607	.016*	1.444
	GenEd/Inclusive	4.89	7.767				
GrowAdaptive	SPED	-3.67	5.132	21	-1.357	.189	1.033
	GenEd/Inclusive	5.05	10.778				
GrowSocEmot	SPED	8.00	2.828	19	-.137	.892	.137
	GenEd/Inclusive	9.16	11.663				
GrowCognitive	SPED	4.00	9.899	17	-.200	.844	.143
	GenEd/Inclusive	5.35	8.972				
GrowComm	SPED	-7.00	1.414	19	-1.995	.061	2.016
	GenEd/Inclusive	5.32	8.525				

Note. * $p < .05$ **Research Question 6**

Research Question 6: Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth for overall general development than general education students in the same classroom?

H₀₆: There is no significant difference in growth for overall general development for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) than general education students in the same classroom.

An independent samples t-test comparing the mean scores of students with disabilities and general education students' overall general development in the inclusion classroom was conducted. The mean for the overall general development for students with disabilities in an inclusive classroom was lower ($M = 12.15$, $sd = 16.262$) than the mean for the overall general

development for general education students in the same learning environment ($M = 15.18$, $sd = 10.522$); $t(101) = -1.099$, $p = .274$. However, a p-value greater than .05 was calculated; therefore, the null hypothesis was retained. No significant difference in growth for overall general development between students with disabilities and general education students in an inclusive classroom was found. With a p-value greater than .05, results suggest no significant difference in growth between groups of students. Running Levene's test for homogeneity of variance with a large p-value also indicated no significant difference between the groups; therefore, equal variance was assumed. An effect size of .266 using Cohen's d was determined, indicating a small difference between means of growth in overall general development. Results are presented in Table 7.

Table 7

Independent Samples t-test on Student Growth for Overall General Development in Inclusion Classroom

Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
SWD	12.15	16.262	101	-1.099	.274	.266
GenEd	15.19	10.522				

Note. * $p < .05$

Research Question 7

Research Question 7: Did students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) have significantly different growth in the five developmental domains than general education students in the same classroom?

H₀7: There is no significant difference in growth in the five developmental domains for students with disabilities who were in the inclusion classroom (no more than 50% SWD on the roster) than general education students in the same classroom.

An independent samples t-test comparing the mean growth score in the five developmental domains for students with disabilities and general education students in the inclusion classroom was conducted. Even though the means for general education students were higher than the means for students with disabilities in all five developmental domains, a significant difference was not found in four of the five domains. Data results are as follows: Physical SWD ($M = 4.89$, $sd = 7.767$), GenEd ($M = 9.66$, $sd = 8.879$); $t(94) = -2.145$, $p = .035$, adaptive SWD ($M = 5.05$, $sd = 10.778$), GenEd ($M = 5.82$, $sd = 9.286$); $t(95) = -.319$, $p = .751$, social-emotional SWD ($M = 9.16$, $sd = 11.663$), GenEd ($M = 13.38$, $sd = 10.597$); $t(93) = -1.523$, $p = .131$, cognitive SWD ($M = 5.35$, $sd = 8.972$), GenEd ($M = 9.73$, $sd = 16.341$); $t(92) = -1.066$, $p = .289$, and communication SWD ($M = 5.32$, $sd = 8.525$), GenEd ($M = 7.90$, $sd = 14.891$); $t(94) = -.725$, $p = .470$. With a p-value greater than .05 in four of the developmental domains, results suggest no significant difference in growth for general education students and students with disabilities.

Running Levene's test for homogeneity of variance with large p-values indicated no significant difference in variance between the two groups of students; therefore, equal variance was assumed. Cohen's d (effect size) was used to determine the size of difference for each of the four developmental domains. Cohen's d ranged from .077 to .379, indicating a trivial to small difference between means of growth in the four developmental domains for students with disabilities who were in the inclusion classroom than general education students in the same classroom.

Growth for the physical domain has a p-value of less than .05, suggesting participation in the early intervention program has a significant difference in growth for general education and special education students. Running Levene's test for homogeneity of variance with a small p-

value indicates equal variance could not be assumed. An effect size of .572 was determined using Cohen's *d*, indicating a moderate difference between mean of growth for this developmental domain.

Based on the results, the null hypothesis was retained for four developmental domains: Adaptive, social-emotional, cognitive, and communication. The null hypothesis was rejected for the developmental domain of physical growth. Results are presented in Table 8.

Table 8

Independent Samples t-test on Student Growth for Five Developmental Domains in Inclusion Classroom

Dev Domain	Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
GrowPhysical	SWD	4.89	7.767	94	-2.145	.035*	.572
	GenEd	9.66	8.879				
GrowAdaptive	SWD	5.05	10.778	95	-.319	.751	.077
	GenEd	5.82	9.286				
GrowSocEmot	SWD	9.16	11.663	93	-1.523	.131	.379
	GenEd	13.38	10.597				
GrowCognitive	SWD	5.35	8.972	92	-1.066	.289	.334
	GenEd	9.73	16.341				
GrowComm	SWD	5.32	8.525	94	-.725	.470	.213
	GenEd	7.90	14.891				

Note. * $p < .05$

Research Question 8

Research Question 8: Is there a significant difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years?

H₀₈: There is no significant difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years.

An independent samples t-test comparing the mean difference in the post-assessment on overall general development for students with disabilities who were enrolled in the early intervention program for the current year or multiple years was conducted. The mean of students enrolled in the current year ($M = 74.67, sd = 19.755$) was not significantly different from the mean students enrolled for multiple years ($M = 66.67, sd = 17.095$); $t(19) = -.929, p = .365$. A p-value greater than .05 was calculated; therefore, the null hypothesis was retained. No significant difference in post-assessment for overall general development between students who were enrolled in the current year or multiple years was found. Running Levene's test for homogeneity of variance with a large p-value also indicated no significant difference in variance between the two groups of students; therefore, equal variance was assumed. An effect size of .433 using Cohen's d was determined, indicating a moderate difference between the means of growth for years enrolled in early intervention. Results are presented in Table 9.

Table 9

Independent Samples t-test on SWD Post-assessment for Overall General Development

Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Current Year Enrollment	74.67	19.755	19	-.929	.365	.433
Multiple Year Enrollment	66.67	17.095				

Note. * $p < .05$

Research Question 9

Research Question 9: Is there a significant difference in the post-assessment for the five developmental domains for students with disabilities compared to students who were enrolled in the early intervention program for the current year or multiple years?

H₀9: There is no significant difference in the post-assessment for the five developmental domains for students with disabilities compared to students who were enrolled in the early intervention program for the current year or multiple years.

An independent samples t-test comparing the mean difference on the post-assessment for the five developmental domains for students with disabilities who were enrolled in the early intervention program for the current year or multiple years was conducted. The mean of students enrolled in the current year was not significantly different from the mean students enrolled for multiple years in any of the five domains. Data results are as follows: Physical current year ($M = 75.83$, $sd = 13.182$), multiple years ($M = 72.11$, $sd = 15.716$); $t(23) = -.524$, $p = .605$, adaptive current year ($M = 85.00$, $sd = 14.560$), multiple years ($M = 74.56$, $sd = 15.846$); $t(22) = -1.424$, $p = .169$, social-emotional current year ($M = 87.67$, $sd = 14.404$), multiple years ($M = 81.06$, $sd = 14.012$); $t(20) = -.978$, $p = .340$, cognitive current year ($M = 86.33$, $sd = 24.064$), multiple years ($M = 73.63$, $sd = 15.405$); $t(20) = -1.478$, $p = .155$, and communication current year ($M = 74.17$, $sd = 9.621$), multiple years ($M = 73.73$, $sd = 11.738$); $t(19) = -.080$, $p = .937$. A p-value greater than .05 was calculated for all five developmental domains; therefore, the null hypothesis was retained. No significant difference in post-assessment for the five developmental domains between students who were enrolled in the current year or multiple years was found. Running Levene's test for homogeneity of variance with a large p-value also indicated no significant difference in variance between the two groups of students; therefore, equal variance was

assumed. Cohen's *d* (effect size) was used to determine the size of difference for each developmental domain. Cohen's *d* ranging from .041 to .686 indicated a trivial to moderate difference in the post-assessment in the five developmental domains based on the years of enrollment. Results are presented in Table 10.

Table 10

Independent Samples t-test on SWD Post-assessment for Five Developmental Domains

Dev Domain	Variable	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Physical	Current Year Enrollment	75.83	13.182	23	-.524	.605	.256
	Multiple Year Enrollment	72.11	15.716				
Adaptive	Current Year Enrollment	85.00	14.560	22	-1.424	.169	.686
	Multiple Year Enrollment	74.56	15.846				
SocEmot	Current Year Enrollment	87.67	14.404	20	-.978	.340	.465
	Multiple Year Enrollment	81.06	14.012				
Cognitive	Current Year Enrollment	86.33	24.064	20	-1.478	.155	.629
	Multiple Year Enrollment	73.63	15.405				
Comm	Current Year Enrollment	74.17	9.621	19	-.080	.937	.041
	Multiple Year Enrollment	73.73	11.738				

Note. **p* < .05

Research Question 10

Research Question 10: Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development?

H₀10: There is no significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment for overall general development.

Chi-square test of independence was calculated to determine a relationship between enrollment in early intervention and outcomes by comparing the difference in the number of students with disabilities in each descriptive category between the pre-assessment and post-assessment for overall general development. Students with disabilities represented the following numbers in each descriptive category for overall general development on the pre-assessment: 30 delayed, 0 below average, two average, and 0 above average. The numbers for each descriptive category on the post-assessment were as follows: 23 as delayed, six below average, two average, and one above average. Results represent a significant relationship between enrollment in early intervention and positive outcomes for student growth as reflected by differences in pre- and post-assessment numbers for each category ($X^2(3) = 23.467, p = .001$); therefore, the null hypothesis is rejected. Results are presented in Table 11.

Table 11

Chi-square test Descriptive Categories Overall General Development for SWD on Pre- and Post-assessment

	Above Average	Average	Below Average	Delayed	Total	<i>df</i>	Chi- Square Value	<i>p</i>
PreAssess	0 (0%)	2 (6%)	0 (0%)	30 (94%)	32 (100%)	3	23.467	.001*
PostAssess	1 (3%)	2 (6%)	6 (19%)	23 (72%)	32 (100%)			

Note.* $p < .05$

Research Question 11

Research Question 11: Is there a significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment across the five developmental domains?

H₀11: There is no significant difference in the number of students with disabilities in each descriptive category on the pre-assessment and post-assessment across the five developmental domains.

Chi-square test of independence was calculated to determine a relationship between enrollment in early intervention and outcomes by comparing the difference in the number of students with disabilities in each descriptive category between pre-assessment and post-assessment for all five developmental domains. Students with disabilities represented the following numbers in each descriptive category for each of the five developmental domains on the pre-assessment and post-assessment respectively (delayed, below average, average, above average). Physical pre-assessment 19, 9, 8, 4, post-assessment 19, 6, 7, 7 ($X^2(4) = 20.560$, $p = .001$), adaptive pre-assessment 18, 8, 6, 0, post-assessment 18, 7, 6, 1 ($X^2(6) = 17.877$, $p = .007$), social-emotional pre-assessment 20, 6, 6, 0, post-assessment, 13, 8, 10, 1 ($X^2(6) = 18.773$, $p = .005$), cognitive pre-assessment 2, 3, 2, 0, post-assessment 20, 5, 6 ($X^2(6) = 25.975$, $p = .001$), and communication pre-assessment 21, 9, 2, 0, post-assessment 18, 8, 5, 0 ($X^2(4) = 21.285$, $p = .001$). With p values less than .05 for all developmental domains, results represent a significant relationship between enrollment in early intervention and outcomes for student growth as reflected by differences in pre- and post-assessment numbers in each category; therefore, the null hypothesis was rejected. Results are presented in Table 12.

Table 12

Chi-square test Descriptive Categories for Five Developmental Domains for SWD on Pre- and Post-assessment

Develop Domain		Above Avg.	Avg.	Below Avg.	Delayed	Total	<i>df</i>	Chi-Square Value	<i>p</i>
Physical	PreAssess	0 (0%)	4 (13%)	9 (28%)	19 (59%)	32 (100%)	4	20.560	.001*
	PostAssess	0 (0%)	7 (22%)	6 (19%)	19 (59%)	32 (100%)			
Adapt	PreAssess	0 (0%)	6 (19%)	8 (25%)	18 (56%)	32 (100%)	6	17.877	.007*
	PostAssess	1 (3%)	6 (19%)	7 (22%)	18 (56%)	32 (100%)			
SocEmo	PreAssess	0 (0%)	6 (19%)	6 (19%)	20 (63%)	32 (100%)	6	18.773	.005*
	PostAssess	1 (3%)	10 (31%)	8 (25%)	13 (41%)	32 (100%)			
Cog	PreAssess	0 (0%)	2 (6%)	3 (9%)	27 (84%)	32 (100%)	6	25.975	.001*
	PostAssess	1 (3%)	6 (19%)	5 (16%)	20 (63%)	32 (100%)			
Comm	PreAssess	0 (0%)	2 (6%)	9 (28%)	21 (66%)	32 (100%)	4	21.285	.001*
	PostAssess	0 (0%)	5 (16%)	8 (25%)	18 (56%)	32 (100%)			

Note * $p < .05$

Summary

Chapter 4 was an examination of the data collected as part of the research study. In this chapter, data from eleven early intervention programs from six sites in the selected school district were analyzed and presented. The data were collected from 113 students who were enrolled in one of the early intervention programs and whose parents consented to participation in the study, 30 students were identified as students with disabilities and 83 as general education. Eleven research questions and null hypotheses were addressed. Chapter 5 discusses suppositions

in regards to research, implications for the district and early intervention programs, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

This chapter contains a summary of findings, discussions, and conclusions as well as recommendations for readers who may use results of the research study to inform their school district's early intervention programs. The purpose of this quantitative study was to determine effects of early intervention participation on kindergarten readiness as measured by the Developmental Profile™ 3. Statistical analysis described in the research study was based on eleven research questions and eleven null hypotheses. Documented results provide information regarding effectiveness of early intervention on kindergarten readiness for all students with a focus on those with disabilities. Data gathered from assessments measured growth for students enrolled in one district's early intervention programs including a comparison of students with disabilities in two class types, a comparison of general education and students with disabilities, students with disabilities multi-year growth in comparison to single-year growth, and program participants (SWD) versus typical student benchmarks.

Summary of the Findings

Participation in the early intervention program had a positive effect on growth scores for overall general development and the five developmental domains; this was statistically true for students with disabilities and general education students. Growth was measured by calculating the difference between a participant's pre- and post-assessment scores for each participant on the DP™ - 3. Although the average growth scores were frequently higher for general education students, there was no significant difference in average growth for the two groups of students for overall general development and four of the developmental domains: Adaptive, social-emotional, cognitive, and communication. In contrast, when analyzing growth in the physical domain, a significant difference was evident between the two groups of students. Equivalent results were

evident when comparing growth of students with disabilities and general education students participating in an inclusive setting and when comparing growth for students with disabilities participating in different learning environments. Again, when comparing students with disabilities to general education peers, students with disabilities did not show as much growth in the physical domain in either comparison; however, students with disabilities in an inclusive setting showed more growth than students with disabilities in a special education setting.

Standard scores from pre- and post-assessment were used to identify and compare the number of students with disabilities in each DPTM – 3 descriptive category. Comparison results showed a significant difference in the number of students in each descriptive category for overall general development and all five developmental domains. Results represent positive outcomes for student growth. Research did not yield a significant difference in post-assessment scores for overall general development or five developmental domains for students with disabilities based on the number of participating years in an early intervention program.

Discussion of Findings

Challenges for students entering kindergarten have been well-documented, and the assumption has been early intervention participation increases kindergarten readiness related to social-emotional and academic competencies. Research most often shows a notable return on investment into high-quality early intervention programs agreeing early intervention programs improve education outcomes for children (Hatcher, Nuner, & Paulsel, 2012; Modeste, 2017; Morgan, 2019; TDOE, 2018).

Growth Comparison of Students in Early Intervention

The study determined growth score for all participants by calculating the difference between pre-assessment and post-assessment scores for overall general development and five

developmental domains. Results of the research study provide strong evidence that by making early intervention programs available more students are ready to enter kindergarten. Participation in an early intervention program for participating students with disabilities and general education students had a positive relationship on overall general development. Results indicated more of those students exhibiting kindergarten readiness skills in all of the developmental domains. Results are consistent with research around increased gains in literacy, language, and math skills during early intervention and noted greater preparedness for grade-level work by kindergarten teachers at the beginning of that first school year (Lipsey et al., 2019).

Comparison of growth between general education and special education students continued to show positive results for both groups of students. Yet, there was a difference in how students with disabilities progressed in the physical domain. Difference was evident when comparing all participants and when looking at only students in an inclusive setting. Physical development of a student was measured by observing tasks involving both large (gross motor) and small (fine motor) muscle coordination, strength, stamina, flexibility, and sequential motor skills. Gross motor development refers to physical skills using large body movements, typically involving the entire body. Children ages four and five can typically climb and descend stairs alone, taking one step at a time, have body control when riding tricycles, skip, and can jump over objects. Fine motor skills involve more precise tasks, typically using hands and fingers, buttoning and unbuttoning, using scissors, and copying shapes. Physical development requires children to build on skills already mastered. Students identified as having a disability or a developmental delay often reach these age-appropriate milestones at a slower rate than their typical peers. The findings can be explained by a delay in progression (sequential motor skills) for students with disabilities due to other related cognitive delays.

Learning Environment Comparison

The research study showed a significant difference in overall general development and the physical domain for students with disabilities who were enrolled in different learning environments. Students who participated in an inclusive setting showed significantly higher growth than students who were in a special education setting. Results are consistent with research identifying inclusion as the first choice when enrolling students with disabilities in early intervention and show positive outcomes increase for students in an inclusive setting, including social and communication skills and academic achievement (Diamond, Others, & ERIC, 1994; Morgan, 2019; OSERS, 2017). Findings are consistent with beliefs that inclusive learning environments provide greater opportunities for social play and more age-appropriate interactions. Time spent in the inclusive setting allows students to develop more elaborate language and vocabulary skills due to stronger peer models. Increased communication skills translate to interactions with other children and adults using interpersonal skills appropriately. The exposure provides more opportunities for students who typically struggle with communicating wants, needs, and emotions and who have a limited vocabulary to experience more positive interactions resulting in a greater ability to regulate emotions and behaviors (Im, Jiar, & Talib, 2019; Morgan, 2019).

Overall general development growth scores for students in both settings and research continues to suggest a link between young children's socio-emotional competence and their chances of early school success, as well as correlation between behavioral functioning of young children and high-quality early intervention programs (Im, Jiar, & Talib, 2019; Romana, Kohen, & Findley, 2010; Welchons & McIntyre, 2015). However, there were no significant differences in four of five developmental domains for students in the two settings. These findings could be a

result of the small number of students with disabilities in the special education setting and the district's design of this specific program. Students in the special education setting receive early intervention in this learning environment due to a need for more intensive support and services. Students in the program typically exhibit a lower cognitive function and have more severe and profound disabilities.

Comparison of Descriptive Categories

Range of standard scores on the DP™ - 3 within one standard deviation below and above mean (85-155) includes about 68% of the population. Results show participants who have a standard score below 85 are below expected benchmarks for same-age peers. A standard score below 70 indicates a child is significantly behind typically developing, same-age peers and demonstrates a deficit at a level requiring intensive intervention. A child in the below-average range (standard score of 70-84) is generally considered to be developing adequately, although at a rate lagging behind same-age peers (Alpern, 2007). Standard scores from the pre- and post-assessment were used to identify and compare the number of students with disabilities in each descriptive category for the DP™ - 3: Delayed, below-average, average, above-average, or well-above average. Results of the comparison identified a significant difference in the number of students in each descriptive category for overall general development and all five developmental domains. Results represent positive outcomes for student growth and consistent with research. Morgan's research indicated students not participating in early intervention have a greater chance of entering kindergarten with decreased academic and social development, therefore contributing to their decreased academic achievement gap (2019).

These results alone lay a strong foundation for investing in early intervention programs for students with disabilities. On the pre-assessment 30 of the 32 (94%) students scored within

the delayed category for overall general development, with the administration of the post-assessment 23 (72%) students remained in this category with six making enough growth to move up to below average and one to average; one student made enough growth to move from average to above average. Results for each developmental domain showed students with positive growth moving to the below-average, average, or above-average category. Results also showed students who moved to the delayed category due to performance on the post-assessment; these findings suggest either a score not reflective of growth or a score not reflecting growth due to the student's age at the time of assessment causing a drop to a lower descriptive category.

Comparison of Single Year vs. Multi-year Post-assessment Performance

Research did not yield a significant difference in post-assessment scores for overall general development or developmental domains for students with disabilities based on the number of participating years in an early intervention program. Students with disabilities can begin participating in an early intervention program at the age of three; for the study, the DPTM-3 was administered only to students who were in programs designated for four- and five-year-olds. Findings do not take into consideration ability levels for students upon initial enrollment in early intervention if it was before the study. More research may be needed to determine if multiple years of participation affect the growth score during the pre-kindergarten year.

Limitations of the Study

Limitations of the study included curriculum implementation, composition of the programs, timeframe of study, limited participation, and assessment administration. The study included data gathered from several early intervention programs in the selected district. All programs utilize the same curriculum for instruction, providing teachers and instructional assistants a full day of professional learning prior to implementation with continued monthly

collaboratives to ensure alignment of curriculum and Tennessee Early Learning Development Standards (TN-ELDS). Each teacher was provided a copy of the teacher's handbook and a full curriculum kit with supplemental resources and materials. The assumption was all classroom teachers were using the adopted curriculum to provide the same content to all students enrolled in the early intervention programs. Each unit consists of a learning overview, vocabulary, a project, learning centers, and daily lessons. Lessons are set up by week and provide daily instructions for teachers; however, the district has not adopted a pacing guide; therefore, there is no way to guarantee consistent implementation of content and standards during the timeframe between the pre- and post-assessment.

Composition of early intervention programs is determined by the district. Grant requirements and supports and services defined in students' IEPs determine program placement each school year. Growth results and student performance on post-assessment could be impacted by the way students are assigned to inclusion or a special education learning environment. Additionally, the study only allowed for six-months of direct instruction between pre- and post-assessment. Measuring growth and performance after completion of a full ten-month school year could affect outcomes of study.

Inclusion in the study required participants to be enrolled at the time of both the pre- and post-assessments. Due to the two-week administration window, transient students and students with poor attendance were eliminated from study. The assessment was not administered as directed by the researcher for some participants. Data entry process revealed some assessors did not include enough responses to establish the basal or ceiling for the student's profile be scored accurately; therefore, those student results were excluded. Enrollment in the district's early intervention program during the pre-assessment window was 286 students; 40% were included in

results of the study, with 47% of those being students with disabilities. The lower participating percentage could be attributed to the two circumstances previously mentioned.

Recommendations

Recommendations for Practice

Findings of the study identified the following recommendations for implementation of early intervention programs for students with disabilities: Continue practice of providing inclusive early intervention programs for students with disabilities, allocate additional resources, personnel, and capital for early intervention, and establish a pacing guide for standard curriculum implementation to ensure students have access to the same opportunities for growth.

Percentages of children enrolled in preschool in the United States is under the percentage of children enrolled at this age level in over 20 countries. Prior research, including research provided from neuroscience, suggested high-quality early intervention can make a critical difference toward a child's future. Cited research and data results from study support investment in early childhood education as a cost-effective method for addressing needs of students with disabilities before kindergarten enrollment. Data results support efforts to allocate more resources to early intervention and are evidence of the need for more programs increasing the numbers of students who have access to programs. A need for additional high-quality early intervention programs designed to increase the number of students who enter kindergarten prepared with basic academic and social-emotional skills needed to be successful in school is evident (DEC/NAEYC, 2009; Modeste, 2016; Morgan, 2019).

Recommendations for Future Research

Results of study indicate an overall positive effect on growth for students with disabilities who participate in an early intervention program. Since the study only included approximately

40% of participating students in one urban district in Upper East Tennessee, the replication by the district in the future with an increased study participation rate is recommended. Replication by other school districts providing services and supports to students with disabilities through early intervention programs is also advisable. Conclusions and generalizations will be more easily drawn to support district efforts for continued funding and increase community aid and cooperation by replicating the study. Continued research efforts would offer additional findings to assist district with allocating resources, personnel, and capital.

The selected school district administered benchmark assessments three times throughout the school year to measure achievement skills and standards. Teachers use assessment data to guide instruction and provide enrichment and remedial opportunities as needed by individual students. Expansion of study encompassing a comparison of benchmark assessment data with DPTM - 3 results could yield interesting findings. Additionally, a comparative study is recommended using early intervention rosters and identified students with disabilities. Findings warrant further exploration of early intervention effects on identification and dismissal of students from special education services to determine if long-term economic investment in school readiness, student achievement, and future workforce is substantiated (Morgan, 2019; Parker, Atchison, & Workman, 2016).

Additionally, expansion of study should include administering DPTM - 3 to students with disabilities upon entry into an early intervention program. Expansion would provide data to determine effects of multiple years of participation on student growth and kindergarten readiness.

Conclusions

The goal of early intervention continues to be preparing students for kindergarten and providing skills for school readiness. Considering readiness goals have been a driving force for establishing early intervention programs and funneling resources into these programs, there has been growing interest in understanding whether school districts are actually meeting goals for participating students. A common statement has been a student's education does not occur in a vacuum and that all early intervention experiences are not the same; students enter school with vast differences in personal, practical, and social-cultural experiences. Life experiences can be viewed as valuable or lacking in the early school participation. Kindergarten (school) readiness goes beyond knowing the academic basic; a child needs a willing attitude, confidence in the process of learning, and strong social-emotional skills (Anasari, 2018; Phillips et al., 2017; Yoshikawa et al., 2013).

Evident from the research findings, early intervention has a positive relationship for kindergarten readiness for students with disabilities, therefore, "we must figure out how to support children with disabilities such that they are physically included, meaningfully engaged, and full participants in early childhood settings" (Sandall et al., 2019). Intentional and planned developmental transitions provide students with a strong start to their school experience. Additional support for the "trajectory hypothesis" is evidenced by research demonstrating student performance academically and socially; early elementary school is a strong predictor of academic, social, and mental health outcomes throughout high school. Findings also suggest interventions provided to increase a student's readiness at entry to school could have long-term benefits (Cowan, P. & Cowan, C., 2009).

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Appendix A: Approval from the School District to Conduct Study

Approval Form for Research Proposals

Please complete the top section of this form and submit it with the information requested on the Kingsport City Schools Research Proposal Guidelines form to the Director of Performance Excellence.

Researcher's Name: Jacki Wolfe

Agency/Institution: Milligan College

Researcher's Email: jawolfe@k12k.com

Phone Number: (423) 378-2194

Title of Research Proposal: The Effects of Early Intervention Program on Kindergarten Readiness for Students with Disabilities

Type of Research Proposal (Check): Dissertation Thesis Independent

Step 1:

- Read the Research Proposal Guidelines and submit the appropriate paperwork to the Department of Performance Excellence.
- Submit questionnaires, surveys, and/or interview questions in advance for review.
- Submit a copy of the IRB approval. This must be completed before final approval will be granted.

Step 2:

- The research proposal and any supporting documentation will be reviewed by the Department of Performance Excellence.
- The researcher will be notified via the phone or email of the approval status.

Approval Status:

- The research proposal is denied. You may contact the Director of Performance Excellence for further clarification.
- The research proposal has been approved. You may proceed with the research in accordance with the [REDACTED] Request for Research Proposal Guidelines.
- The research proposal is approved pending the receipt of the IRB.
- The research proposal is pending upon the resolution of the following condition(s) :

[REDACTED]
Superintendent of Schools or Designee

7-22-19
Date

Appendix B: IRB Approval



Date: June 18, 2019

From: The Institutional Review Board (IRB) at Milligan College

Re: *The Effects of Early Intervention Program on Kindergarten Readiness for Students with Disabilities at a Selected School District in Upper East Tennessee*

Submission type: Revised Submission

Dear Jacki Wolfe,

On behalf of the Milligan College Institutional Review Board (IRB), we are writing to inform you that your study *The Effects of Early Intervention Program on Kindergarten Readiness for Students with Disabilities at a Selected School District in Upper East Tennessee* has been approved as expedited. This approval also indicates that you have fulfilled the IRB requirements for Milligan College.

All research must be conducted in accordance with this approved submission, meaning that you will follow the research plan you have outlined here, use approved materials, and follow college policies.

Take special note of the following important aspects of your approval:

- Any changes made to your study require approval from the IRB Committee before they can be implemented as part of your study. Contact the IRB Committee at IRB@milligan.edu with your questions and/or proposed modifications.
- If there are any unanticipated problems or complaints from participants during your data collection, you must notify the Milligan College IRB Office within 24 hours of the data collection problem or complaint.

The Milligan College IRB Committee is pleased to congratulate you on the approval of your research proposal. Best wishes as you conduct your research! If you have any questions about your IRB Approval, please contact the IRB Office and copy your faculty advisor if appropriate on the communication.

Regards,

The IRB Committee

Appendix C: Informed Parental Consent

Informed Consent

Milligan College

Title of Study: The Effects of Early Intervention Program on Kindergarten Readiness for Students with Disabilities at a Selected School District in Upper East Tennessee

You are being asked to take part in a research study about the effects of participation in an early intervention program on kindergarten readiness for students with disabilities. You were selected because your student is currently enrolled in an early intervention program for ages four and five in the selected district. Please read this form carefully and ask any questions you may have before agreeing to take part in the study.

What the study is about: School systems are required to provide early intervention services for students with disabilities when they reach the age of three. Providing instruction to meet criteria for kindergarten readiness in five identified areas (physical, adaptive, social-emotional learning (SEL), cognitive, and communication) is the goal of student learning. This study seeks to examine the effectiveness of early intervention on kindergarten readiness for students with disabilities by assessing growth for students ages four and five in one selected district in Upper East TN.

*A copy of the Early Childhood Development Chart is being provided; this chart includes skills assessed in each of the five identified areas.

What we will ask you to do: Students who are ages four and five and enrolled in one of the district's early intervention programs will be assessed using the Developmental Profile – 3 (DP3). The test administration will be completed in August and late February/early March, allowing for six months of instruction between the pre and posttest. As a parent/guardian, if a teacher observation or interview is not possible, you may be asked to complete the Parent/Caregiver Checklist.

The DP3 assessment is already used by the district to determine kindergarten readiness; however, permission to include your individual student's results as part of the research is being requested. If you give permission for your student's results to be used in the study, all identifying data will be removed prior to the completion and/or publication of the final document.

Risks and benefits: No additional risk to participants beyond student observations and student, parent/guardian, and/or teacher interview.

The information gathered during this study has the potential to support district efforts to continue and enhance early intervention programs and increase community support.

Your answers will be confidential. The records of this study will be kept private; all identifying information about the student will be kept locked and confidential by the researcher. The assessment information and related student data are provided to the researcher yearly in her role as the Director of Special Education for the selected district and are protected by FERPA. In her role as researcher, she will remove all identifiable information prior to publishing final research document in order to protect the privacy of the students.

Taking part is voluntary: All students enrolled in the early intervention program ages four and five will be assessed using the DP3 two times during the school year; including your student's data as part of the study is completely voluntary. If you decide not to take part, it will not affect your student's access to the early intervention program or any related activities/curriculum. If you decide to take part, you are free to withdraw consent at any time. Students who withdraw will not be treated differently and will still continue to receive the same access to early intervention as those who participate fully in the study.

If you have questions: The researcher conducting this study is Jacki Wolfe, Director of Special Education. Please ask any questions you have now or if you have questions later, you may contact Jacki Wolfe at jawolfe@[REDACTED] or at 423-[REDACTED].

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature _____ Date _____

Your Name (printed) _____

Person obtaining consent:

Signature _____ Date _____

Printed name _____

This consent form will be kept by the researcher for at least three years beyond the end of the study.

Appendix D: Developmental Profile™ 3 Instructions

Interview Form

by Gerald D. Alpern, Ph.D.
Illustration by Joy Allen



Developmental Profile 3

DP-3



Child's name: _____

Examiner's name: _____

Informant's name: _____

Relationship to child: _____ Child's gender: Male Female

	YEAR	MONTH
Date of testing:	_____	_____
Date of birth:	_____	_____
Age:	_____	_____

INSTRUCTIONS

Where to Start

For children aged 0-0 to 1-11, begin by administering Item 1 on each scale. For children aged 2-0 and older, begin at the correct start item on each scale. Score the parent's (or caregiver's) response to each item by circling *Yes* or *No*.

Establishing a Basal

If the first five items administered are scored *Yes* (unless starting with Item 1), a basal level has been established. If one or more of the first five items are scored *No*, test backward to establish a basal level, and then resume testing forward from the highest item completed.

When to Stop

Stop administering a scale when five consecutive items are scored *No* (or when the last item of the scale is administered).

Scoring Directions

Refer to chapter 2 of the DP-3 Manual for instructions on how to calculate the score for each scale and how to complete the Scoring/Profile Form.

Scoring Tips

Most of the questions ask whether the child *does* perform a task. To score *Yes*, the child must not only be able to perform the task, he or she must actually perform it some of the time. However, a few of the questions ask whether the child *can* perform a task. For these questions, a *Yes* means that the child has shown on at least one occasion that he or she is able to perform the task.

Some questions ask about skills or behaviors that the child mastered long ago and does not do anymore; for example, "Does the child babble or use other sounds that seem to be attempts to talk?" The child may have babbled for a while but then moved on to more advanced forms of speech. The item would be scored *Yes* because babbling is behavior that the child performed successfully in the past.

If the parent (or caregiver) is unsure whether an answer should be *Yes* or *No*, encourage him or her to make an educated guess.

Additional copies of this form (W-462A) may be purchased from WPS. Please contact us at 800-648-8857 or wpspublish.com.

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