THE DIFFERENCE BETWEEN HOMOGENEOUS GROUPING AND HETEROGENEOUS GROUPING IN GIFTED STUDENTS' READING ACHIEVEMENT

by

Amy Erin London

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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ABSTRACT

The educational focus of the United States is on ensuring that all students are proficient in the areas of reading and math. Most academically gifted and talented students are placed in heterogeneously grouped classrooms; thereby, ignoring the needs of these talented readers. This quantitative causal-comparative study sought to determine if a difference existed between the reading achievement growth of gifted elementary students who were homogeneously grouped for reading instruction as compared to gifted elementary students who were heterogeneously grouped for reading instruction with a sample size of 119 gifted elementary students in the State of Georgia. Additionally, it looked at differences in pre- and posttest scores of each group individually. The participants were divided into two groups (homogeneous and heterogeneous) according to reading instruction type. An analysis of covariance determined that there was no significant difference between the homogeneous and heterogeneous groups. Paired samples *t*-test determined that there were differences in pre- and posttest scores for both the homogeneous group and the heterogeneous groups. Recommendations for future research are to conduct research with a larger sample and controlling for such things as teacher experience, teacher certifications, instructional methods, testing, and grouping.

Keywords: gifted, reading, elementary, homogeneous grouping, heterogeneous grouping

Copyright Page

Dedication

This dissertation is dedicated to my family; to my husband, Mark, who tolerated the long nights of writing, declining invitations to “ride,” not doing my share of the housework or laundry; to my daughters, Lexie and Linzi, who encouraged me to finish what I started even when I was in tears; to my late grandmother, Willene Broome, who always told me that I could do anything I decided to do; to my aunt, Myrna Lanier, who has always believed in me and pushed me to go for my dreams; and to my mother-in-law, Ruth, who waited patiently for me to finish so that we could get back to doing fun things.

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This is not a journey that everyone will take. It is a path fraught with doubts, uncertainties, and more than the average stress. I did not take this journey alone for God was with me every step of the way. He was there when I was convinced that I could not write another word or research one more topic. He was there when the overwhelming guilt of putting my family second hit hard. He was there when it seemed that I would not be able to fulfill my dream. God was with me as I typed each word, read each journal article, and conducted one more search for one more journal article. For his loving kindness, I am forever grateful. To be his child is a miraculous thing, for I feel his love and guidance every day. I am so thankful that he put each of the above-named people in my life when I needed them.

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List of Abbreviations

Adequate Yearly Progress (AYP)

Analysis of Covariance (ANCOVA)

College and Career Ready Performance Index (CCRPI)

Elementary Secondary Education Act of 1965 (ESEA)

Every Student Succeeds Act of 2015 (ESSA)

Full-time Equivalency (FTE)

Grade Point Average (GPA)

Heterogeneously Grouped (HE)

Homogeneously Grouped (HO)

Individualized Education Plan (IEP)

Institutional Review Board (IRB)

Intelligence Quotient (IQ)

Measures of Academic Progress (MAP)

More Knowledgeable Other (MKO)

National Association for Gifted Children (NAGC)

National Association of School Psychologists (NASP)

No Child Left Behind Act of 2001 (NCLB)

Numeric Grade Point Average (NGA)

Standard Error of Measurement (SEM)

Student Growth Model (SGM)

Student Growth Percentile (SGP)

United States of America (U.S.)

Zone of Proximal Development (ZPD)

CHAPTER ONE: INTRODUCTION

Overview

Chapter One includes the background information for this study as well as the problem statement, purpose statement, and the significance of the study. The research questions are also included in this chapter. Definitions for the various terms used in this study are included at the end of the chapter.

Background

When a coach of a little league or high school team benches the most talented players, parents and fans revolt. Spectators hurl questions and insults from the stands. Everyone wants to know why the most talented players are not playing. After all, when the most talented players are not afforded the opportunity to hone their talents and skills, they are in danger of not reaching their full potential; therefore, future opportunities for them may be lost. This public outcry of unfairness does not hold true when the education of our most talented students is undermined or even sabotaged by weak curriculum, untrained teachers, and poor administrative decisions. In fact, for the past several decades, the United States is believed to be undergoing a "quiet crisis" concerning the education of gifted students (Renzulli & Reis, 1991). Almost no one other than parents, educators, and education experts are paying attention to the situation, which has garnered the term quiet crisis as there is no public outcry and no quick mobilization to address the crisis (Duke TIP, 2015).

Historical Context

According to the federal government report, "National Excellence: A Case for Developing America's Talent," which was released in November 1993, "the U.S. [was] squandering one of its most precious resources -- the gifts, talents, and high interests of many of

its students" (p. 1). The report highlighted the fact that most gifted and talented students spent their day without any attention to their special learning needs (U.S. Department of Education, 1993). In response to the release of the "National Excellence" report, the National Association for Gifted Children declared their support of mandating services to meet the unique needs of gifted and talented students because without such programs these students would not reach their full potential. In the Executive Summary of the 2014 National Survey of Gifted and Talented Programs, Callahan, Moon, and Oh (2014), found that "gifted programs in many instances are not providing the types of services necessary to fully address the gifted youths' academic, social, and emotional needs so that they may reach their full potential" (p.12). Also, according to the report, 41.5% of systems surveyed (elementary programs) plan no changes to their current gifted programs. Failure to meet the academic needs of the gifted and high ability students will impact the number of graduates in some professions and will consequently affect the national economy. From 2004-2005, China graduated 517,225 engineers and India graduated 170,000 engineers; yet, the United States only graduated 133,854 engineers (Wadhwa, Gereffi, Rissing, & Ong, 2007). Accepting the failure of the educational system to meet the needs of gifted students will result in a long-term social and economic decline for the United States (Plucker, Giancola, Healey, Arndt, & Wang, 2015).

Social Context

Although there has been moderate progress in reducing the achievement gaps within the minimum competency groups, the same is not true for the high-achievers and gifted and talented gaps (Plucker, Hardesty, & Burroughs, 2013). In fact, Plucker, et al., (2015) report that students with high intellect from all income brackets are generally being ignored in all states.

The No Child Left Behind Act of 2001 (NCLB) was the most inclusive school improvement initiative that the United States had ever undertaken. It was comprehensive in its scope of achievement and thorough in its requirements. The crux of NCLB was that all skills begin with reading and math; therefore, students should be proficient in both reading and math during their early years in school (United States Government, 2004). The No Child Left Behind Act conjectured that for too long, too many children never mastered either of the necessary skills of reading or math.

Following the implementation of NCLB, the focus of the American educational system was on closing the achievement gaps as well as on increasing the awareness of those students who have often been left behind: economically disadvantaged, limited English proficient, and students with disabilities (Briggs, 2009). Closing the achievement gap included the subgroups of ethnicity, gender, disability, and socio-economic status. The No Child Left Behind Act did not specifically address the education of the more capable students such as the gifted and talented population, which resulted in the academic progress and gains of the country's most gifted and talented students to stall and in most cases become stagnant (Adelson, McCoach, & Gavin, 2012; Reis & Boeve, 2009). For the first time in the history of the reauthorization of the Elementary and Secondary Education Act (ESEA) of 1965, gifted and talented students are specifically included in the accountability (Brighton, Moon, & Huang, 2015) requirements of the Every Student Succeeds Act of 2015 (U.S. Department of Education, 2016). The Every Student Succeeds Act of 2015, states that local school systems are required to disaggregate and report student achievement data at each achievement level on the collected data (U.S. Department of Education, 2016).

Meeting the needs of these high ability or gifted readers has been a problem for decades in reading instruction (Renzulli & Reis, 1991; Research Committee, 1960). The fear that gifted students are not reaching or will not reach their potential is longstanding. Chu and Myers (2015) contend that failure to meet the needs of gifted students can negatively affect their development. The importance of providing effective reading instruction for gifted students cannot be overstated (Barbe & Norris, 1963). "The problem is not that the [gifted] child is reading below his grade level, but that he is reading below his level of ability" (Strange, 1953, p. 23). Strange (1953) also stated that elementary gifted students were neglected and just treading water and, in some cases, declining in achievement in reading classes, which is supported by the current research of Assouline, Colangelo, VanTassel-Baska, & Lupkowski-Shoplik (2015). "In the overcrowded classrooms of today, there is more reason than ever to fear that the gifted child, because he is able to read up to his grade level, will be neglected" (Barbe, 1954, p. 144). Reis, et al., (2004) stated that gifted students are offered few opportunities to excel in the regular classroom. Barbe (1954) further stated that gifted students have fewer and fewer opportunities to receive enriched programs. Klemm (1956) suggested that gifted students may be "retarded" in reading achievement due to the inconsistency between gifted students' potential and their actual achievement. Reis et al. (2004) found that due to lack of challenging reading material, some gifted students will opt to read material that was unchallenging so that it could be read with minimal effort.

Theoretical Context

Beginning with entrance to Kindergarten, the focus is on teaching students to read. While Kindergarten, first grade, and second grade teachers lay the foundation for reading, students in third through eighth grades are transitioning from learning to read to reading to learn

(Chall, 1996; Indrisano & Chall,1995; State of Georgia Department of Education, 2008). Most gifted students are already reading to learn before entering second grade; therefore, they need less instruction on learning how to read. Gifted students frequently read above grade level and above that of their peers. Gifted students need challenging work to strengthen their reading skills. When gifted students sit in classrooms where the reading material and assignments are below their reading level, boredom sets in, their reading progress is often delayed and "their opportunities to learn how to react to challenge are diminished" (Reis et al., 2004, p. 315). For the past decade, most gifted students in the elementary grades did not receive challenging reading materials and lessons due to the focus on getting struggling performers to the proficient level as mandated by NCLB. In fact, the academic gains of the gifted and talented students deteriorated during this period (Assouline, et al., 2015).

For all students to obtain maximum growth and reading achievement, they must attain high levels of comprehension, read complex texts, and read independently for 25 minutes each day (Renaissance Learning, 2012). According to Vygotsky (1978), students should learn within their Zone of Proximal Development (ZPD), which is the range between needing adult guidance and independent learning for an individual student. Learning within the ZPD is critical for every student including gifted students, but students must be developmentally ready for learning (Piaget, 1953/2006; Piaget & Inhelder, 1969). In the case of gifted students, many of them are ready for more complex and higher level learning; however, opportunities to learn at these levels are not always being provided.

Problem Statement

Reis et al. (2004) recommended further research concerning reading instruction for gifted readers. Dimitriadis (2012) reported, there is a "paucity of research investigating aspects of

provision for gifted children within primary schools, particularly in mathematics." Reis and Boeve (2009) evaluated gifted students' responses to challenging reading material in grades three and four and found that due to lack of experience with challenging material, these gifted students resisted reading challenging material which was within their ability to read.

Adelson et al. (2012) reported that overall gifted programs were not increasing student achievement and recommended rigorous research on programs and curriculum that improve gifted students' achievement. Adelson and Carpenter (2011) recommended further research to compare gifted students in a gifted program with their like ability peers who were not in a gifted program (p. 274).

The problem is gifted students are not being served effectively by being placed in heterogeneous classrooms for reading instruction. Gifted students who are not reaching their full potential in reading are often bored in class and even lose interest in school. Spending time on academics is not equivalent to time spent learning, being actively engaged, or engaged in critical thinking activities (Halpern, 2013). A major tenet of gifted education is that gifted students require scaffolding or specialized settings in order for them to reach their full potential (Makel, Wai, Putallaz, & Malone, 2015). Ignoring the needs of gifted students diminishes the possibility of them reaching their full potential. There is not enough research on the achievement levels of gifted elementary students who have received reading instruction at their reading level in either a heterogeneous or homogeneous classroom to close the gap.

Purpose Statement

The purpose of this causal-comparative study was to determine if there is a difference between the reading achievement scores of elementary gifted students by grouping. This study will use archival data from the 2014-2015 school year from an accredited school system using

STAR Reading® scores to determine reading achievement growth for students in grades K-5. The independent variable is the instructional grouping of gifted students (heterogeneous/homogeneous). The independent variable is not manipulated, which is an accurate procedure for a casual-comparative design (Gall et al., 2007). The dependent variable is reading achievement of the elementary gifted students as measured by the STAR Reading® test. According to Gall et al., (2007), the use of ANCOVA will control for initial differences between groups before comparisons are made for within groups and between groups. ANCOVA will make the groups equal while controlling for one or more variables.

Significance of the Study

Too frequently young gifted students with advanced reading abilities receive instruction in the regular classroom setting with a heterogeneous grouping of students. Within this setting, few gifted students receive instruction on their reading level as the teacher spends the majority of her time assisting the low performers (Mendoza, 2006). The focus of NCLB was on ensuring that every child learned; however, in many instances the learning of gifted and advanced learners has been sacrificed to ensure that the struggling students learn. The Every Student Succeeds Act includes an accountability requirement for students at all levels of achievement (U.S. Department of Education, 2016); therefore, the needs of gifted and high ability learners must be considered when making educational decisions. In order for gifted students to excel and reach their full potential, they must learn in classes structured to meet their unique needs, which include advanced content and learning with a "like-performing cluster group," and when these classes are not available, the gifted students should be provided with independent studies (Rogers, 2007).

Reis and Boeve (2009) determined that few gifted students are receiving challenging work at the level they need to excel. According to Vogl (2014), gifted students in regular classes (heterogeneous) demonstrated a decline in student-teacher relations and interest in school; however, the students in gifted classes (homogeneous) did not show any such declines and maintained stable levels in student-teacher relations and interest in school. In the United States, there is little differentiated instruction for gifted students (Reis & Renzulli, 2010), which means that gifted students in a heterogeneous reading class will receive little instruction on their reading level. Ignoring the needs of gifted students has long-term societal ramifications because a disproportionate amount of accomplishments, inventions, and discoveries come from high achievers or gifted people (Simonton, 2009) and these people have a great impact on the economic prosperity of any country as well as a global impact (Shavinina, 2009). Simonton (2009) further explained that given this information, it was all the more critical to invest in the education and development of the gifted population.

The results of this study will contribute to the knowledge base on effective grouping models for teaching gifted elementary students. The results will provide guidance to teachers and administrators in determining instructional grouping models for the teaching of reading to meet the needs of gifted elementary students. Encouraging students to reach their full potential will enable the students to prosper academically and provide better futures for them. Providing the appropriate instructional setting for gifted students will allow them a greater chance of reaching their full potential. In order to provide gifted students with the opportunity to excel and reach their potential, the education system must evolve toward a "school without a ceiling" in which gifted and non-gifted students alike can develop their talents and aim to reach their full potential (De Corte, 2013). The differences between students in reading readiness and reading

achivement is present from the earliest years of school; therefore, gifted students need curriculum and instructional practices during the early years (Brighton, Moon, & Huang, 2015). Neihart and Tao (2014), state that gifted students are best served by subject-based classrooms in which students are ability grouped.

Research Questions

There were three research questions for this study:

RQ1: Is there a significant difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement?

RQ2: Is there a significant difference between homogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

RQ3: Is there a significant difference between heterogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

Definitions

1. *Ability Grouping* – Ability Grouping refers to the practice of placing children of similar academic ability together for instruction (Swiatek, 2001).
2. *Acceleration* – Acceleration is a type of intervention that allows students to move an educational program faster, and at younger ages. The level, complexity, and pace of the curriculum is matched to the student's readiness and motivation (Colangelo, Assouline, & Gross, 2004).
3. *Cluster Grouping* – Cluster Grouping is the practice of placing a group of identified gifted students, usually 6-8 students, into an otherwise heterogeneous classroom rather

than dispersing the gifted students throughout the grade level or courses (State of Georgia Department of Education, 2015). This is an approved practice for grades Kindergarten through 12th grade.

4. *Differentiated Instruction* – Differentiated Instruction is a classroom practice with a balanced emphasis on individual students and course content and includes instruction differentiated by content, process, and product, as well as interest and readiness (Tomlinson & Imbeau, 2010).
5. *Gifted* – As defined by the State of Georgia, a gifted student is a "student who demonstrates a high degree of intellectual and/or creative ability(ies), motivation, and/or excels in specific academic fields, and as such needs special instruction and/or special services to achieve at levels relative to her abilities" (State of Georgia Department of Education, 1998).
6. *Homogeneously Grouped* – Homogeneously Grouped refers to classes or groups of students who are in classes or groups in which the students are of like-performance or like ability (Colangelo, Assouline, & Luplowski-Shoplik, 2004).
7. *Heterogeneously Grouped* – Heterogeneously Grouped refers to classes or groups of students who are in classes or groups in which the students are of varying abilities and performance levels, and there is no attempt at structuring the class or group to include only students of like-abilities or like-performance (Colangelo, Assouline, & Luplowski-Shoplik, 2004).
8. *Resource Class* – A Resource Class is a class in which gifted students are "pulled-out" of the regular classroom for gifted services, typically one day each week (State of Georgia Department of Education, 2015).

CHAPTER TWO: LITERATURE REVIEW

Overview

A long-standing question for educators and parents alike has been how best to educate gifted students. No doubt, gifted students learn differently than other students, yet questions remain as to what is the best approach for providing the maximum opportunity for gifted students to reach their full potential in reading as well as in other areas. The purpose of this study was to determine if gifted elementary students achieve better in heterogeneously grouped classrooms or homogeneously grouped classrooms for reading instruction where gifted students receive reading instruction on their level. Research is lacking on the achievement levels of gifted elementary students who have received reading instruction at their reading level in either a heterogeneous or homogeneous classroom. Additional research is needed to close the gap in research. This chapter includes a theoretical framework, characteristics of gifted students, history of gifted education, related literature, and a summary.

Theoretical Framework

The theoretical frameworks of constructivist learning that support this study are the Cognitive Development Theory of Jean Piaget and the Social Development Theory of Lev Vygotsky.

Cognitive Development Theory

According (Piaget, 1953) mental growth and physical growth are inseparable, meaning that as a child grows physically, he also grows mentally; however, Piaget asserted that a child must be developmentally ready for the learning. Piaget's work defined the developmentally appropriate levels of learning for children. Piaget's theory has two aspects: the process of learning and the stages we move through as we acquire this ability (Huitt & Hummel, 2003;

Piaget, 1953). Piaget theorized that as children grow physically, they pass through four developmental stages mentally: sensorimotor, preoperational, concrete, and formal operational (Flavell, 1963; Piaget, 1953). According to Piaget, the sensorimotor stage begins at birth and ends around two years of age. The child's development of object permanence is the most important development at this stage. Object permanence is knowing and understanding that when an object is no longer in view, it still exists. The preoperational stage begins around the age of two and lasts until the age of four years. The inability of the child to think logically defines the preoperational stage; however, during this stage, language matures, memory and imagination develop, and egocentric thinking dominates (Huitt & Hummel, 2003; Piaget, 1953). The concrete operational stage occurs between the ages of seven to eleven years. This stage includes the beginning of abstract thinking. Egocentric thinking begins to decrease, and logical thinking begins to emerge (Huitt & Hummel, 2003; Piaget, 1953). The formal operational stage emerges at approximately age 12 and lasts into adulthood. During this stage, children develop logical thinking, deductive reasoning, and egocentric thinking may reemerge during adolescence. It is believed that only "35% of high school graduates in industrialized countries obtain formal operations and that many people do not think formally during adulthood" (Huitt & Hummel, 2003; Piaget, 1953).

Social Development Theory

Vygotsky's (1978) Social Development Theory has two main principles: The More Knowledgeable Other (MKO) and the Zone of Proximal Development (ZPD). Unlike Piaget (1953), Vygotsky believed that social learning tended to precede development. The MKO refers to anyone that has a higher level of knowledge, understanding, or ability than the child does. This is frequently an older adult, teacher, or coach; however, it can also be someone younger, a

peer, or computer (Learning Theories Knowledgebase, 2012). Learning is believed to occur in the ZPD, which is "the distance between a student's ability to perform a task under adult guidance and/or with peer collaboration and the student's ability to solve the problem independently" (McLeod, 2018; Vygotsky, 1978).

The ZPD is an "individual's range of potential for learning" (Lutz & Huitt, 2004, p. 75; Vygotsky, 1978). The ZPD is divided into three parts: what can be done independently, what can be done with help or guidance from an adult or peer, and what cannot be done even with help and guidance (Lutz & Huitt, 2004; McLeod, 2018; Vygotsky, 1978). In essence, the ZPD is the actual range between what a child can actually do independently and the child's potential of what can be done independently. Due to the use of archival data, this study focused on what the child actually did independently.

Integration of the Theories of Piaget and Vygotsky

Both Piaget (1953) and Vygotsky (1978) believed that infants were born with the basic materials/abilities for intellectual development (McLeod, 2018; Piaget, 1953; 2006; Vygotsky, 1978). Piaget believed that learning occurred in a developmental continuum while Vygotsky believed that learning occurred by interacting with the environment. While both Piaget and Vygotsky believed that due to their curiosity, young children are actively involved in developing new understanding or schema, Piaget emphasized "self-initiated discovery" and Vygotsky emphasized the "social contributions to the process of development" (McLeod, 2018; Piaget, 1953/2006; Vygotsky, 1978). Vygotsky believed that social interaction and learning preceded development.

Both Piaget's (1953) and Vygotsky's (1978) theories framed this study. This study sought to determine the effects of grouping gifted elementary school students in a homogeneous

classroom versus a heterogeneous classroom for reading instruction. Those students in a homogeneous grouped classroom received instruction on their level of learning or ZPD, whereas those gifted students grouped in the heterogeneous classroom may not have received instruction in their ZPD, but rather received instruction based upon their grade-level placement. Classrooms are to be developmentally appropriate. Students will perform within the stage for which they are developmentally ready and not expected to perform within a stage of development for which they are not ready to perform. When theories of both Piaget and Vygotsky guide a classroom environment, it is usually more in line with the needs of those students who are homogeneously grouped for reading instruction. Educators have attempted to provide classroom environments that are suitable for gifted students since 1868 with the first organized effort to attend to the needs of gifted students (Jolly, 2018; NAGC, n.d).

Related Literature

President Lyndon Baines Johnson signed the first Elementary and Secondary Education Act (ESEA) into law in 1965. This law was an attempt to equalize educational opportunities for all students. President Johnson believed that "full educational opportunity" must be "our first national goal" (U.S. Department of Education, 2016). Through this law, school districts serving low-income students were eligible for federal grants for textbooks, library books, special education centers, and college scholarships for low-income students. Although the ESEA of 1965 intended to provide all students with full educational opportunity, no accountability existed to track student performance. The ESEA of 1965 was a civil rights law attempting to provide an equal education to all students through the awarding of federal funds to state agencies in order to improve elementary and secondary education (U.S. Department of Education, n.d.).

In 2001, President George W. Bush introduced the No Child Left Behind Act (NCLB), a reauthorization of the ESEA, in an effort to improve education in America by ensuring that all students receive a quality education. The main premise of NCLB was closing the achievement gaps among subgroups as designated by ethnicity, socio-economic status, disabilities, and gender. In order to close the achievement gap, schools found it necessary to restructure curriculums, programs, and schedules. In short, the federal government imposed a set of standards and criteria on the states requiring the students of those states in the aforementioned subgroups to perform at the same levels of the other average students.

Immediately the focus of education and academic achievement was on the struggling students or low performers. When teachers in Colorado estimated the amount of time, they spent teaching and assisting gifted or advanced students, their responses totaled 11% (Mendoza, 2006). Little time is left for those students who are gifted or high ability when the teachers are focused on the students who lack basic proficiency skills (Jolly & Matthews, 2018). Few gifted students are receiving the level of challenge that they need to continue to excel in school (Reis, 2009). In order for gifted students to reach their full potential each school year, they must receive purposeful and challenging work. Far too often, gifted students are placed in heterogeneous classrooms for reading instruction and left to their own devices since they are too advanced for the rest of the class. Without appropriately challenging reading material, the progress of gifted students' is stunted (Reis et al., 2004). Even with more than a decade of NCLB accountability measures concerning the closing of achievement gaps, the gaps among high-ability students were in some cases closing slowly while growing in others (Plucker, Hardesty, & Burroughs, 2013). The NCLB Act drew attention to the nation's educational crisis; however, it did little to ensure that no gifted child would be left behind. Plucker, Burroughs, and Song (2010) reported that

available data suggested the implementation of NCLB made significant progress in closing the minimum competency achievement gaps; however, the data yielded different information for high ability students. The low percentage of high ability students scoring at the highest level on achievement tests points to those students being under-served (Plucker et al., 2010).

Building upon the progress made by the No Child Left Behind Act of 2001, President Barack Obama reauthorized the 50-year old Elementary and Secondary Education Act (ESEA) of 1965 by signing into law the Every Student Succeeds Act (ESSA) on December 10, 2015 (U.S. Department of Education, 2016). Although the predecessor of ESSA, No Child Left Behind, and the original ESEA of 1965 purported that, all children should have full educational opportunity and that no child would fall through the cracks, neither legislation specifically included or addressed the needs of gifted and talented students. The Every Student Succeeds Act of 2015 addressed the needs of gifted students through several mandates. These mandates encompassed requiring states to include all achievement levels in their disaggregation of data; allowing local education agencies to report how they assist schools in identifying gifted students as well as how those students are served; and, ensuring that teachers of gifted students receive the necessary professional learning to be effective in teaching gifted students. The ESSA of 2015 also mandated encouraging the implementation of best practices for gifted students, such as early entrance to kindergarten, enrichment, and acceleration among others. The ESSA reauthorized the Javits Gifted and Talented Students Education Act.

After decades of excluding gifted students from the Elementary and Secondary Education Act, ESSA addressed the specific needs of gifted and high ability students. Although this inclusion is long overdue, questions remain as how to best ensure that gifted students are provided the opportunities to reach their full potential in reading classes. Low achieving

students will still attend school and will most likely be in a heterogeneous classroom; therefore, being in the same classroom as gifted and high ability students. Low achieving students will still demand more of the teacher's attention at the rate of 80% while academically advanced students will receive 5% of the teacher's attention (Farkas & Duffett, 2008). As children progress through the developmental stages as described by Piaget and Inhelder (1969), they should be encouraged to reach their highest level. Gifted students progress through most of the developmental stages faster than average students do. Further, gifted students as well as struggling students need to receive instruction in their Zone of Proximal Development as explained by Vygotsky (1978).

Meeting the needs of all students is a daily struggle for most teachers. There are students who are one or more years below grade level in the same classroom with students who are two or more years above grade level. Teachers are often unsure how to meet the needs of both groups within the classroom. Just as there are different characteristics of students who struggle to learn, there are many different characteristics of gifted students. The concern of how to meet the needs of gifted students began in 1868 with the creation of the first program for gifted students. That concern lingers as educators grapple with how to serve the gifted students of today.

History of Gifted Education

According to the National Association of Gifted Children (NAGC, n.d.), public schools have initiated programs or efforts to educate gifted students since 1868 when William Torrey Harris, St. Louis superintendent of schools, made the first systematic effort to develop a program to meet the needs of gifted students. In 1901, the first school for the gifted opened in Worster, Massachusetts. Lewis Terman, the "father" of the gifted education movement, published the Stanford-Binet, an intelligence test, in 1916 (Terman, 1916). The publishing of the Stanford-

Binet Intelligence Test revolutionized the concept of intelligence and changed the face of American education. The purpose of the original intelligence test created by Albert Binet and Theodore Simon was to identify "dull" children in France (Binet & Simon, 1916); however, once the test was available in America, it quickly became a measure of intelligence for all intelligence levels and is still in use today.

Leta S. Hollingworth established the Special Opportunity Class for gifted students at P.S. 165 in New York City in 1922, and fourteen years later in 1936, Hollingworth established P.S. 500, a school for gifted students ages 7 – 9 (Gray & Hollingworth, 2014; Jolly, 2018). After the Soviet Union's launch of Sputnik in 1957, the Standford-Binet was widely used in an effort to identify those students who would most benefit from advanced math, science, and technology courses (Tidwell, 1980). In 1958, The National Defense Education Act passed, which was the federal government's first effort in gifted education. *The Marland Report* published in 1972 issued the first formal definition of giftedness. In 1974, the Office of the Gifted and Talented within the U.S. Office of Education received official status. *A Nation at Risk* published in 1983 highlighted the failure of America in educating the gifted and talented students. In 1988, Congress passed the Jacob Javits Gifted and Talented Students Education Act as part of the Reauthorization of the Elementary and Secondary Education Act.

The University of Connecticut, University of Virginia, Yale University, and Northwestern University were sites where National Research Centers on the Gifted and Talented were established in 1990; however, funding for the research centers ended in 2012. In 1993, the U.S. Department of Education published *National Excellence: The Case for Developing America's Talent*. This report outlined how America was neglecting gifted and talented students. The National Association of Gifted Children published the first gifted standards in 1998. In

2001, the No Child Left Behind Act (NCLB), the reauthorization of the ESEA of 1965, passed in Congress. The No Child Left Behind Act included the Javits program and a revised definition of giftedness. In 2004, *A Nation Deceived: How Schools Hold Back America's Brightest Students* was published. Most recently, President Obama reauthorized NCLB through the passage of Every Student Succeeds Act of 2015 and signed it into law on December 10, 2015.

More than 160 years have passed since the first attempt at designing a program to educate gifted children. With over a century of experience in attempting to meet the diverse needs of gifted students, it seems reasonable that the educational professionals of the United States would be experts in this field. Too many gifted students are not reaching their full potential. All children are different and have different needs; yet the majority of gifted service delivery models operate as a one-size-fits-all method (Callahan, Moon, & Oh, 2017).

Consider the average high school varsity football team. Each member of the team had to qualify to be on the team, yet each member has different abilities and characteristics. Some of the players excel in throwing the football; some excel in running, while others excel in blocking. Just as the players on the varsity team have different abilities and characteristics, so do gifted students. Gifted students possess unique characteristics, which teachers must learn and understand in order for them to meet the needs of their gifted students.

Characteristics of Gifted Children

According to the National Association for Gifted Children (NAGC) (2006), the characteristics of young gifted learners, ages three to eight, can include but are not limited to the acquisition and application of advanced vocabulary and/or the development of early reading skills. These children also possess acute observational skills, intense curiosity, ability to pay attention intensely for a period of time, as well as a high level of retention of information (Clark,

2008). The NAGC also lists "early demonstration of talent in the arts, task commitment beyond same-age peers, and an ability to understand complex concepts, perceive relationships, and think abstractly" as additional characteristics of young gifted learners. Other characteristics of gifted students of all ages include strong curiosity, inquisitive nature, large vocabulary, advanced comprehension of word nuances, metaphors, and abstract ideas as well as often self-taught reading and writing skills (Bildiren, 2018; Johnsen, 2018; Roessingh & Bence, 2017; Swiss & Olsen, 1976; Webb, Gore, Amend, & Devries, 2007). Gifted children are usually alert as infants who speak and demonstrate motor skills early (McGee & Hughes, 2011). McBee, Peters, and Miller (2016) posit that giftedness is an individual trait with "stable manifestation across academic domains, lifespan, and educational arrangements" (p. 275).

These students need a learning environment that is rich in content and provides many opportunities for challenging work. When gifted students lack the appropriate challenge in school, they become bored and their education suffers. Many gifted students underperform in mathematics and reading due to not having their educational needs met (Kroesbergen, van Hooijdonk, Van Viersen, Middel-Lalleman, & Reijnders, 2016). Quite often, in an effort to have gifted children conform to the pace of the other children in the class, gifted children are held at a comfortable or suitable pace in comparison to the other children in the classroom (Gross, 1999). This practice is so prevalent in Australia that it has the special name of "cutting down the tall poppies" (Gross, 1999, p. 207). During the era of NCLB, many gifted students failed to reach their full potential and in fact many gifted students declined in achievement (Assouline, Colangelo, VanTassel-Baska, & Lupkowski-Shoplik, 2015). Terman (1916), the father of gifted education, remarked "even genius languishes when kept over-long at tasks that are too easy" (p. 13).

Not only do gifted students possess unique characteristics, they also possess different levels of giftedness. Giftedness is not a category of one-size-fits-all. Rather giftedness is comprised of many different levels. When gifted students receive appropriate differentiated services, their intellectual functioning levels increases creating an even wider gap between them and their peers (Van Tassel-Baska J. , 2015).

Levels of Giftedness

Too often teachers view gifted students as a homogeneous group meaning that "gifted is gifted." Nothing could be farther from the truth. To assume that there is but one level of giftedness would be as big of a mistake as assuming that all athletes can throw or kick a ball at only one level. Gagné (1985) defines gifted as students who are within the top 10% of their class, with no distinctions for various levels. There are five levels of giftedness as defined by Gross (2000), which are mildly (or basically) gifted with an intelligence quotient (IQ) range of 115-129; moderately gifted with an IQ range of 130-144; highly gifted with an IQ range of 145-159; exceptionally gifted with an IQ range of 160-179; and profoundly gifted with an IQ range of 180 and above. Gross also provided a prevalence for each level of giftedness. The prevalence of a mildly (or basically) gifted child is 1:6 – 1:44; moderately gifted 1:44 – 1:1,000; highly gifted 1:1,000 – 1:10,000; exceptionally gifted 1:10,000-1:1 million; and profoundly gifted is fewer than 1:1 million. According to Gross M. (2000), researchers have found significant differences between both affective and cognitive abilities of moderately gifted and profoundly gifted children. With such ranges in IQ levels, it is easy to accept that the overall development of gifted students would vary just as much. All students who are determined to be gifted whether mildly, profoundly, or any distinction in between, will be included in this study.

Just as there are many different levels of giftedness, there are many different definitions and requirements to determine eligibility for services. These definitions and eligibility requirements are not necessarily consistent from state to state. The federal definition of gifted and talented students as it appears in the Elementary and Secondary Education Act states gifted and talented children are capable of high achievement intellectually as well as creatively, artistically, academically, and require services and activities not usually provided by the school in order for them to develop (U.S. Department of Education, n.d.).

Gifted Eligibility

The definitions of what constitutes a gifted student and the requirements to be eligible for services vary from state to state. Marland (1971) defined gifted as children who possessed outstanding abilities and were capable of high performance and because of such they required differentiated educational programs or services beyond those regularly provided by the school. Within that definition, Marland also listed six areas for consideration, "general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts, psychomotor ability" (Marland, 1971, p. ix). Marland (1971) further stated that using the criteria he presented, a school would identify a minimum of 3% to 5% of the school's population as gifted. Renzulli (2011) held onto the revised definition of giftedness that he offered in 1978, which stated that giftedness consisted of an "interaction among three basic clusters of human traits" (p. 87). Renzulli identified these three clusters as "above-average general abilities, high levels of task commitment, and high levels of creativity" (p. 87). Most recently, Subotnik, Olszewski-Kubilius, and Worrell (2011) proposed a definition, which asserted giftedness was developmental, and must be cultivated. The definition also included the "manifestation of performance or production at the upper end of the distribution in a talent

domain" even when compared to other high-performing individuals in the same domain (Subotnik et al., 2011, p. 7). In spite of numerous experts in the field refuting the belief that giftedness only equals a high IQ (Borland, 2009; Renzulli, 1978; Renzulli, 1986; Renzulli & Purcell, 1996; Worrell, 2009), many states continue to use IQ as a decisive factor or the most important factor in determining gifted eligibility.

Gifted eligibility in the State of Georgia

The State of Georgia (2015) utilizes a psychometric or a multi-criteria approach to identify eligible gifted students. The psychometric approach requires that a student "score in the 99th percentile (for grades K-2) or the 96th percentile (for grades 3-12) on the composite or full scale score of a norm-referenced test of mental ability and meet one of the achievement criteria" (p. 6). The multi-criteria eligibility approach requires that students achieve at least the minimum score on three of four areas, which include mental ability, achievement, creativity, and motivation. According to the National Association for Gifted Children (2015), the multi-criteria approach to identifying gifted students is increasing.

Eligibility requirements for the area of mental ability are a score "at or above the 96th percentile on a composite or full-scale score or appropriate component score on a norm-referenced test of mental ability" (State of Georgia, 2015, p. 7). The achievement score must be "at or above the 90th percentile on the total battery, total math, or total reading sections(s) of a norm-referenced achievement test or have produced a superior student-generated product or performance, where the superior performance is one that can be translated into a numerical score at or above 90 on a 100 point scale as evaluated by a panel of qualified evaluators" (State of Georgia, 2015, p.7). The creativity component requires a score "at or above the 90th percentile on the total battery score of a norm-referenced test of creative thinking, receive a score at or

above the 90th percentile on a standardized creativity characteristics rating scale, or receive from a panel of qualified evaluators a score at or above 90 on a 100 point scale on a structured observation/evaluation of creative products and /or performances" (State of Georgia, 2015, p.7-8). The area of motivation requires that students "receive a score at or above the 90th percentile on a standardized motivation characteristics rating scale, receive from a panel of qualified evaluators a score at or above 90 on a 100 point scale on a structured observation or evaluation of student-generated products and/or performances, or for grades 6-12 have a grade point average (GPA) of at least 3.5 on a 4.0 scale where a 4.0 = A and a 3.0 = B, or a numeric grade point average (NGA) of 90 percent on a 100 point scale where 100 = A and an 89 =B" (p. 8).

The use of rating scales is limited, for example using a rating scale for the area of motivation, prohibits the use of a rating scale to evaluate the area of creativity. When a grade point average or numeric grade point average is used to determine eligibility, the average must be from core subject areas such as "mathematics, English/language arts, social studies, science, and full year world languages" and the grades must be a "two-year average of grades prior to evaluation" (State of Georgia, 2015, p. 8).

Gifted Education Service Delivery Models in Georgia

There are many different delivery models for gifted education; however, they all have the same purpose of attending to the unique characteristics and needs of gifted learners while also ensuring that they receive the appropriate level of challenge (Scot, Callahan, & Urquhart, 2009). The State of Georgia offers the following as service delivery models under the direct services category: resource class, advanced content, and cluster grouping. Collaborative teaching and internship/mentorship fall under the category of indirect services. It is important to note that the internship/mentorship service delivery model is only available for qualified gifted students in

grades 9-12. Georgia offers the opportunity for school systems to apply for an approved innovative model (State of Georgia, 2014). The resource class, advanced content, and cluster grouping can all be considered as a method of differentiated instruction as long as differentiation occurs in one of the following areas: content, process, or product.

Acceleration. Acceleration is a strategy frequently recommended for gifted and talented students. Acceleration often alleviates boredom, which allows students to progress through an educational program at faster rates or at a younger age than is typical. Acceleration means "matching the level, complexity, and pace of the curriculum to the readiness and motivation of the child" (Colangelo, Assouline, & Gross, 2004, p. 1). Support for acceleration comes from Kulik (2004) who contends that "no other arrangement for gifted children works as well as acceleration, and the achievement effects of current school reform models seem negligible when compared to the effects of acceleration" (p. 21). Rogers (1992) put to rest two myths about acceleration. The first is that "acceleration is acceleration" meaning that all types of acceleration are "basically the same" and that acceleration has negative effects on the social and emotional well-being of gifted students. Rogers' research clearly suggests that acceleration has different forms and that acceleration does not harm gifted students. In its simplest form, acceleration is allowing a student to participate or enroll in a class that is based upon his proficiency instead of his chronological age (Sahin & Levent, 2015).

Acceleration can be in the form of "grade skipping" and within grade acceleration. Grade skipping is the actual process of skipping the next grade and enrolling into the next higher grade (Dare, Nowicki, & Smith, 2019). If a second-grade student accelerates through grade skipping, she may have gone from kindergarten directly to second grade skipping first grade altogether. Within grade acceleration or content acceleration is when a third-grade student

attends a higher-level class (e.g. fourth grade class) in a content area and then attends all other classes within the grade level as chronologically assigned. Acceleration and especially grade skipping are a compelling and effective way to promote academic achievement of gifted students (Gronostaj, Werner, Bochow, & Vock, 2016) .

Different students need different methods and techniques. Likewise, students with different levels of intelligence, aptitude, and ability need different methods and techniques. In 1986, Van Tassel-Baska argued that acceleration is merely permitting students to proceed at a pace and level that is comfortable for them and at which allows the student to excel. Van Tassel-Baska also stated that when forcing high-ability students to wait for other students to master what they themselves have already mastered, high-ability students become bored and frustrated which often leads to negative behaviors. When students lack challenging lessons in school, the time spent in school does not reflect the actual time spent learning (Makel, Wai, Putallaz, & Malone, 2015).

Cluster grouping. When the cluster-grouping model is used for service delivery, a small group of identified gifted students (usually six-eight students) are placed in an otherwise "heterogeneous classroom rather than being dispersed among all of the rooms/courses at that grade level" (State of Georgia Department of Education, 2012). In this service delivery model, the classroom teacher must have a current approved gifted endorsement added to the teaching certificate. The State of Georgia limits this model to only two segments per day, which roughly equals two subjects per day.

In a cluster grouped classroom, all students are grouped by ability with students from each group placed in the classroom; however, no far-below average students will be placed in the classroom with gifted students (Brulles & Winebrenner, 2012). Cluster grouping creates a more

challenging classroom environment and provides a "pathway to higher achievement for all students" (p. 42). Brules, Cohn, and Saunders (2010) report that gifted students in gifted cluster classrooms demonstrated achievement growth without regard to their demographic group. Matthews, Ritchotte, and McBee (2013) report that schoolwide cluster grouping may be beneficial to both gifted and non-gifted learners; however, the positive effects of schoolwide cluster grouping may not appear until the year after the students are cluster grouped. Further, it appeared that there was a greater benefit to mathematics achievement than to reading achievement. According to Kettler (2014), gifted students demonstrate advanced achievement mainly in the areas of reading and math as compared to regular education students.

Resource class. Gifted students receiving gifted services through the resource class model attend a class taught by a certified gifted specialist usually one day per school week. The State of Georgia requires that only gifted students attend this class according to the guidelines as set forth by the State of Georgia Board of Education (State of Georgia Department of Education, 2012). Additional requirements for this model include a focus on interdisciplinary enrichment activities but not on any one content area. The curriculum must have an academic foundation and be based upon the state mandated standards. The State of Georgia limits the number of segments for this model to a maximum of 10 segments per week (State of Georgia Department of Education, 2012).

Advanced content. The advanced content service delivery model is appropriate for grades kindergarten through twelfth grade. The State of Georgia requires that students receiving services through this model be "grouped on the basis of achievement and interests, which include Career, Technical and Agricultural Education, English language arts, fine arts, mathematics, science, social studies, and world languages" (State of Georgia Department of Education, 2012).

Unlike the other service delivery models, non-identified gifted students who "demonstrate exceptional ability and motivation in a particular content area" (State of Georgia Department of Education, 2012) may be allowed to participate in the class. The State of Georgia (2012) limits the number of such classes for students in kindergarten through fifth grade to no more than two segments per day of advanced content.

Collaborative teaching. Although the State of Georgia approves the collaborative teaching model for grades kindergarten through twelfth, it is the only indirect service model in the State of Georgia for students in kindergarten through fifth grade, as the Internship Model is for students in grades 9-12 only. In the collaborative teaching model, the gifted specialist does not teach the student. The gifted specialist assists the regular classroom teacher in planning appropriate lessons and activities for the gifted students in the classroom. This model is similar to the cluster grouping model in that a "maximum of eight identified gifted students are placed into an otherwise heterogeneous classroom" (State of Georgia Department of Education, 2012). The regular classroom teacher provides the direct instruction with the guidance for differentiation from the gifted specialist. Differentiation alone is not a service delivery model for gifted education in the State of Georgia.

Differentiated Instruction

Differentiation is a "philosophy, set of principles, or way of thinking about teaching and learning" (Tomlinson & Imbeau, 2010, p. 13), which guides a teacher in lesson development and instruction for the purpose of ensuring that all students have the opportunity to learn the same standards. The simple theory of differentiated instruction is that teachers should vary their instrucional approaches and adapt the curriculum to meet the diverse needs of the students in classrooms (Tomlinson, 2014). Tomlinson and Imbeau explain that in a differentiated

curriculum, students are offered different approaches to content (what they learn), process (how they learn), product (how they demonstrate what they have learned), and assessment (how they are evaluated on their learning). The State of Georgia defines a differentiated gifted curriculum as "courses of study in which the content, teaching strategies, and expectations of student mastery have been adjusted to be appropriate for gifted students" (State of Georgia, 2015).

Watts-Taffe, et al., (2013) states that differentiation requires teachers to be flexible in their instructional methods and approaches and that teachers must adjust the curriculum and their teaching to modify the information for the students rather than expecting the students to modify the curriculum and information for themselves. Tomlinson (2014) asserts that teachers who differentiate for their students are providing the individual students with the opportunities to learn as deeply and as quickly as possible knowing that not all students' processes and plans will be the same. Differentiation is as appropriate and necessary for gifted learners as it is for struggling learners. However, teachers find it more difficult to differentiate for gifted students than for students with individualized education plans (IEP) because the accommodations for the content, pace, and strategies for students with an IEP are prescribed (Rakow, 2012). Differentiation for gifted students requires that teachers be familiar with above grade level standards, be able to teach the content at a greater depth, as well as provide challenging resources. Even when grouping gifted students homogeneously, they are still a heterogeneous group, thereby, requiring differentiation specific to their abilities (De Corte, 2013; Gentry, 2014). Instruction must be adapted to the specific potential and needs of gifted students (Chu & Myers, 2015; Cronback, 2002). Although, gifted students comprise a heterogeneous group (Reis & Renzulli, 2009), differentiation for gifted students is "largely missing and not efficiently practiced" (Reis & Renzulli, 2010). Gifted or high-ability students are often left to work

independently as the teacher works with those less capable (Smith & Arthur-Kelly, 2016). It is essential that the weak and struggling students receive the maximum amount of assistance and opportunities for them to reach their full potential; however, in a fair and equal education system the same would hold true for gifted students. In 2008, 5% of 900 public school teachers in grades 3 through 12, erroneously believed that gifted students received one-on-one instruction and 10% believed that those students received curriculum and instruction that met their abilities (Farkas & Duffett, 2008). In spite of research, training, and understanding differentiation practices, modifications to instructional practices rarely occurred (Shaunessy-Dedrick, Evans, Ferron, & Lindo, 2015). Lubinski (2016) stated that failure to provide for the differences among students could be the most inefficient practice in education today.

Although homogeneously grouping gifted students is not a service delivery model in the State of Georgia, it is a strategy that was often used in the public schools until the idea of any type of grouping became associated with the antiquated idea of tracking.

Grouping

Grouping of gifted students for instructional purposes has been used since 1901 when the first school for gifted students opened (National Association for Gifted Children, 2008). Grouping for gifted students is beneficial for their academic growth and using different forms of grouping can meet the needs of gifted students (De Corte, 2013; Potts, 2019). Homogeneously grouping gifted students allows those students to experience a complex and challenging learning environment, which supports the theory of constructivist learning. When gifted students are in heterogeneously grouped classrooms where the instructional pacing is at the level of the lowest leveled learner or struggling learners, gifted students become bored and often lose interest in learning. Farkas and Duffett (2008) reported that 73% of teachers agreed that “too often the

brightest students are bored and under-challenged in school" and they are not receiving sufficient opportunities to thrive (p. 52). Gifted students experience an educational system in which chronological age determines the offered educational opportunities not competency, and they also experience a lack of intellectual challenge (Coleman, Micko, & Cross, 2015).

Schools and teachers should use the methods proved most effective; however, even the easiest to implement policy of acceleration is not widespread (Plucker, Giancola, Healey, Arndt, & Wang, 2015). Heterogeneous grouping is beneficial to all students; however, "homogeneous classes may serve the needs of academically talented and gifted students without detrimental effects to other students served in heterogeneous classrooms" (Shields, 2002, para. 1). Studies have shown that homogeneously grouping students by ability provides positive outcomes for all (Coleman, 2016; Gentry, 2016). Gifted students should identify with a heterogeneous class; however, gifted students should be regrouped by ability when reducing heterogeneity is important for learning as is the case with math or reading instruction (Slavin, 1987). Grouping gifted students is an exemplary gifted education practice (NAGC, 2009). The National Association of School Psychologists endorses homogeneous grouping by skill level in the subject areas of reading and mathematics (NASP, 2005). Since the implementation of NCLB, both low- and high-achieving students have made gains; however, low-achievers have made greater gains (Loveless, 2008). This disparity in gains for the high-achieving group of students is an "excellence gap" (Plucker et al., 2010).

Xiang, Dahlin, Cronin, Theaker, and Durant (2011), reported that about two in five students who were high-achieving students in early grades were not high-achieving students just four years later. On average, these students declined from above 90th percentile to just below the 80th percentile. This decline will have a significant impact on future educational opportunities

for these students, as students who score at or above the 90th percentile are more likely referred to gifted programs and other advanced placement or honors classes.

No student should have her opportunities limited because of her age, race, or any other factor that is beyond her control. Education should be about creating true learning opportunities for ALL students – including gifted students. According to Ford (2015), every student can reach his potential in schools where everything is intentially designed to invite optimal development and teachers seek out and help students realize their potential. Achievement grouping allows teachers to adjust the curriculum to meet the needs of the students and to facilitate learning (Gentry, 2014).

Grouping practices in elementary schools focus on placing students in particular groups to access services. Most commonly, students are grouped for additional teaching or remediation for the struggling learners while the students with Individual Education Plans receive services in a variety of ways. Placement in these groups depends upon achievement data and requires frequent reevaluation to ensure appropriate placement. In the United States, the word grouping as it applies to gifted students has become synonymous with the word tracking. Nothing could be farther from the truth. Historically, tracking as used in the United States was a "rigid practice placing students in educational tracts, such as college bound, skilled labor, or the street" (Rakow, 2012, p. 38). Tracking did not allow for any flexibility as once placed in a track, the student remained there. Grouping students by achievement, ability, or disability requires frequent reevaluation and flexibility.

Grouping allows gifted students to have their academic needs met daily with opportunities for challenging assignments (Kitsantas, Bland, & Chirinos, 2017). Like students with physical disabilities or learning disabilities, gifted students possess their gifts and intellect

all day every day, not just the one day each week that they spend with the gifted specialist. Grouping alone is not enough. Gifted students need challenging work, opportunities for self-directed learning, as well as discovery and independent inquiry (Roessingh & Bence, 2017). Some benefits to gifted and high-ability students due to homogeneous grouping include a stronger peer group, possible improvements in instructional resources, and a more appropriate curriculum (Bui, Craig, & Imberman, 2014). Differentiation through curricular acceleration or enrichment must be an integral part of the grouped classroom (Kulik, 1992). "Student's growth on both ability and achievement tests from year to year is affected by maturation, interest, quality of instruction, out-of-school experiences, and many other personal and social factors" (Lohman & Korb, 2006, p. 460). Gifted students who receive quality instruction that is "engaging and appropriately challenging can result in cognitive growth that is larger than expected" when the student is tested from year to year. Conversely, gifted students who are in a classroom with less challenging instruction, less engaging instruction, and with higher distractions will demonstrate less growth on subsequent tests. Collins and Gan (2013), in a study of 9,000 elementary students in 135 elementary schools, found that students in homogeneously grouped classes in both high achievement and low achievement groupings performed better than students who were heterogeneously grouped. These results were without regard to language proficiency, special education services, or gifted education services. Some experts in the field of education believe that differentiation within the classroom is sufficient for gifted students to reach their full potential; however, Van Tassel-Baska (2007) states that best practice in gifted education is to group gifted students homogeneously by subject area for instruction at an advanced level. Steenbergen-Hu, Makel, and Olszewski-Kubilius (2016) question why ability grouping and

acceleration are not more widely used since there is such a long history of research behind these methods showing their effectiveness.

Summary

Many myths surround the education of gifted students. Two such myths are "gifted children can make it on their own" and "gifted students do not need special attention to be successful" (De Corte, 2013). These statements are far from the truth. Marland (1971) identified that a large percentage of dropouts were gifted students. Matthews (2006) reported that 37 gifted students dropped-out of high school in North Carolina alone. Those 37 gifted students are the equivalent of more than one full classroom of students. Van Tassel-Baska (2006) reported that 38% of high ability learners do not finish college. Lack of motivation and underachievement are issues among the gifted population. Many of the brightest students are bored out of their minds because schools are focusing the majority of their attention and funds on those who are not performing or succeeding in school. Many gifted students are being left behind due to teachers focusing on those students classified as not proficient for the purposes of Adequate Yearly Progress (AYP) as determined by the No Child Left Behind (NCLB) Act of 2001. The myths surrounding gifted children are "more than inaccurate; they are destructive. They prevent the gifted child from being understood, accepted, and served appropriately by the school system. Some humiliate the child personally. Others are used as an excuse for negligence" (Silverman, 2009; Silverman, 2017).

Due to past efforts to increase achievement, which focused on increasing the number of students in the minimum competency levels, many gifted students as well as other talented readers have their reading needs ignored in the regular classroom where they are heterogeneously grouped for instruction. All children must be taught how to react to challenging

work. Ignoring the needs of gifted readers can stunt their progress and their opportunities to react to challenging work lessened (Reis et al., 2004). "Talented readers' abilities in reading will not develop if they are never asked to work to their full potential" (Reis et al., p. 315). Ignoring the needs of gifted students and their desire for challenging work prevents them from reaching their full potential, thereby placing a ceiling on their opportunities to reach their full potential (De Corte, 2013). Learning to read is a complex task that requires mastery of many difficult skills. The ability to read can be categorized into the skills of decoding and comprehension (Teach For America, 2011). The International Reading Association contends that there is "no single method or single combination of methods that can successfully teach all children to read" (International Reading Association, 1999). Yet without any formal instruction many gifted children teach themselves to read. Terman (1925) discovered that approximately half of his subjects learned to read prior to beginning first grade, and about 20% of those subjects learned to read before age five. Given the propensity of gifted children to master the complex task of learning to read on their own without formal instruction and their ability to learn quickly, it seems only prudent to group these students with like abilitied peers in order to accelerate their progress.

While there is substantial research on gifted students in grades three through 12, and even college, there is little research that includes gifted primary-aged students. This study investigated the difference between the reading achievement scores of gifted elementary students in grades Kindergarten through fifth grade and being in homogeneous and heterogeneous classrooms for reading instruction.

CHAPTER THREE: METHODS

Overview

This study sought to determine if there is a difference in STAR Reading® scores between homogeneously grouped gifted elementary students in reading and heterogeneously grouped gifted elementary students in reading. This chapter includes the design of the study, as well as, the research questions, hypotheses, participants and setting, instrumentation, procedures, and data analysis.

Design

This study used archival data from the 2014-2015 school year from an accredited school system, which used Renaissance Learning's STAR Reading® assessment for students in grades K-5 to study the reading achievement in elementary gifted students who were either homogeneously grouped for reading instruction or heterogeneously grouped for reading instruction. This was a causal-comparative research design because the causes were studied after their effect was applied to the variable (Campbell & Stanley, 1963). This was a non-experimental design, as the independent variables were not manipulated. This causal-comparative design was used to determine if a difference existed between the reading achievement of gifted elementary school students who were homogeneously grouped for reading instruction and gifted elementary school students who were heterogeneously grouped for reading instruction. The purpose of a causal-comparative research design is to study the cause-and-effect relationship in an attempt to explain trends or occurrences in education.

There were two categories of independent variable of grouping type in this study. The first category included students who received homogeneous grouping for reading instruction and the second, those who received heterogeneous grouping for reading instruction. The independent

variable was not manipulated, which is an accurate procedure for a casual-comparative design. The dependent variable was reading achievement of the elementary gifted students as measured by the STAR Reading® test at the end of the school year. The covariate was the STAR Reading® test administered at the end of the prior school year.

Research Questions

There were three research questions for this study:

RQ1: Is there a difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement?

RQ2: Is there a difference between homogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

RQ3: Is there a difference between heterogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

Null Hypotheses

There were three null hypotheses:

H_{01}: There is no significant difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement.

H_{02}: There is no significant difference between homogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment.

H_{03}: There is no significant difference between heterogeneously grouped gifted elementary school students' pretest and posttest scores STAR Reading® assessment.

Participants and Setting

This study used archival data from the 2014-2015 school year from four elementary schools of an accredited school system, which used STAR Reading® scores for students in grades K-5. The school system, Shirley Harrison School System, a pseudonym, is in central Georgia serving approximately 5,000 students and has a rural designation with a high population of middle to high socioeconomic students. This county has a poverty rate nearing 25% (University of Wisconsin Population Health Institute, 2015).

The population consisted of 157 identified gifted students with a sample size of 119 randomly selected gifted elementary students in grades 2-5 from the school system's 2014-2015 database within the State of Georgia. According to Gall et al. (2007), the sample size exceeded the required minimum sample size of 111 for a medium effect size with statistical power of 0.7 at the 0.05 alpha level. The sample of 119 students consisted of 52 males (44%) and 67 females (56%) with a racial composition of 101 White (85%), 11 Black (9%), two Hispanic (2%), zero Asian (0%), and five Multi-racial (4%). There were no students in the categories of Pacific Islander, American Indian, or Other. By grade, there were 25 second graders (21%), 24 third graders (20%), 35 fourth graders (29%), and 35 fifth graders (29%). The students were identified as being either homogeneously grouped or heterogeneously grouped for reading instruction. The homogeneously grouped students were students in which the students were grouped for reading instruction based upon their abilities and performance. There were 84 students (71%) in the homogeneously grouped reading classroom. The homogeneous group consisted of 44 females (52%) and 40 males (48%) with 18 second graders (21%), 10 third graders (12%), 26 fourth graders (31%), and 30 fifth graders (36%). The racial composition of

this group was 74 White (90%), six Black (7%), two Hispanic (2%), and two multi-racial (2%) (see Tables 3.1 & 3.2).

Table 3.1

Demographic Information by Grade Level

Grade	Male	Female	Black	White	Hispanic	Multi-racial
2	7 (5%)	18 (15%)	3 (2%)	20 (17%)	1 (1%)	1 (1%)
3	6 (5%)	18 (15%)	0 (0%)	21 (18%)	1 (1%)	1 (1%)
4	17 (14%)	18 (15%)	2 (2%)	32 (27%)	-	2 (2%)
5	22 (18%)	13 (11%)	6 (5%)	29 (24%)	-	-
Total	52 (44%)	67 (56%)	11 (9%)	102 (85%)	2 (2%)	4 (3%)

Note: cells with a dash (-) are cells with no available data.

Table 3.2

Demographic Information by Grouping

Grouping	Male	Female	Black	White	Hispanic	Multi-racial
			Grade 2			
HO	7 (39%)	11 (44%)	3 (17%)	13 (72%)	1 (5%)	1 (5%)
HE	-	7 (100%)	-	7	-	-
Total	7 (28%)	18 (72%)	3 (12%)	20 (80%)	1 (4%)	1 (4%)
			Grade 3			
HO	1 (10%)	9 (90%)	-	8 (80%)	1 (10%)	1 (10%)
HE	5 (36%)	9 (64%)	-	13 (93%)	-	1 (7%)
Total	6 (25%)	18 (75%)	-	21 (88%)	1 (4%)	2 (8%)
			Grade 4			
HO	13 (50%)	13 (50%)	-	26 (100%)	-	-
HE	4 (44%)	5 (56%)	2 (22%)	6 (67%)	-	1 (11%)
Total	17 (49%)	18 (51%)	2 (5%)	32 (91%)	-	1 (3%)
			Grade 5			
HO	19 (63%)	11 (37%)	3 (10%)	27 (90%)	-	-
HE	3 (60%)	2 (40%)	3 (60%)	2 (40%)	-	-
Total	22 (63%)	13 (37%)	6 (17%)	29 (83%)	-	-

Note: HO = homogeneously grouped; HE = heterogeneously grouped.

The heterogeneously grouped students were students who were not grouped for reading instruction based upon their abilities and performance. The heterogeneous group included gifted students. There were 35 students (32%) in the heterogeneously grouped reading classrooms consisting of 23 females (66%) and 12 males (34%) with seven second graders (20%), 14 third graders (40%), nine fourth graders (26%), and five fifth graders (14%). The racial composition of this group was 28 White (80%), five Black (14%), zero Hispanic (0%), and two multi-racial (5%) (see Tables 3.1 & 3.2).

Instrumentation

The STAR Reading® test was the instrument for this study. STAR Reading® was developed and published by Renaissance Learning circa 1995 (Renaissance Learning, 2019). STAR Reading® provides norm-referenced scores for grades 1-12, criterion-referenced measures of students' instructional reading levels, and a way for teachers to track student growth throughout the year.

The purpose of STAR Reading® is to provide an accurate measure of a student's reading comprehension by using the student's instructional reading level (Renaissance Learning, 2015). Additionally, STAR Reading® assesses reading achievement comparative to national norms and utilizes a consistent manner of longitudinally tracking student reading growth; however, STAR Reading® is not intended to be used as a high-stakes test even though the normed data provided is accurate. Due to the high correlation between the STAR Reading® test and high-stakes tests, scores yielded by STAR Reading® can be used diagnostically by teachers as well as to predict a student's performance on a high-stakes test (Renaissance Learning, 2015). The instrument has been used in several studies (Nunnery, Ross, & McDonald, 2006; Palmiter, Arcaira, White, & Reisner, 2009; Ross, Nunnery, & Goldfeder, 2004; White, Palmiter, Sinclair, & Reisner, 2011;

White, White, Palmiter, & Reisner, 2010). Renaissance Learning (2014) conducted a study linking the Northwest Evaluation Association Measures of Academic Progress (MAP) and STAR Reading® and STAR Math®. The study yielded a strong relationship between MAP Reading Growth® and STAR Reading® with a correlation of 0.87, while the correlation for MAP Language Usage Growth® and STAR Reading® was 0.83, with a correlation of 0.92 for MAP Math ®Growth and STAR Math®.

This study used the second generation of the STAR Reading® test, which utilizes Item Response Theory for adaptive item selection and scoring instead of the traditional test theory from the previous test (Renaissance Learning, 2015). The fixed-length adaptive test had 2,048 total items and included the original vocabulary in context as well as the last five items in each test being longer, authentic text passages; however, the test continued to only measure reading comprehension, a single construct (Renaissance Learning, 2015). Adaptive Branching is used as the item selection procedure, which allows the test to essentially be customized for each student based upon each student's current achievement level. According to Renaissance Learning (2015), Adaptive Branching offered "significant advantages in test reliability" (p. 4). Additional studies testing the reliability and validity of STAR Reading® have been conducted (Algozzine, Wang, & Boukhtiarov, 2011; Sewell, Sainsbury, Pyle, Keogh, & Styles, 2007).

Renaissance Learning (2015) stated that "reliability refers to the degree of measurement precision" (p. 49). When conducting the reliability tests for STAR Reading®, Renaissance Learning (2015) had a sample size of N = 69,738 students in grades 1-12. Renaissance Learning (2015) reported an overall generic reliability of 0.95, which was estimated by determining the ratio of error variance to Scaled Score variance and subtracting that ratio from one. Internal consistency reliability coefficients such as Cronbach's alpha and Kuder-Richardson Formula 20

cannot be calculated for adaptive tests such as STAR Reading®. The coefficients ranged between 0.89 and 0.93 with the low (0.89) being in grades 3 and 4 and the high (0.93) being in grades 10, 11, and 12. Renaissance Learning (2015) stated, "these reliability estimates are quite consistent across grades 1-12, and quite high for a test composed of only 25 items" (p. 51). The overall split-half reliability coefficients were reported as 0.92 with a range of 0.88 - 0.91 with the low coefficient being in grade one and the high coefficient being in grade 12. Again, Renaissance Learning stated that the estimates were consistent across grade levels (grades 1-12) and high for a test of only 25 items. An alternate form of reliability was also completed using the test-retest method. The test-retest method had a sample size of N = 3,263 students and yielded reliability coefficients of 0.80 - 0.90. The lowest coefficient was in grades 8, 10, and 11 while the highest coefficient was in grade 12. The overall reliability coefficient for the test-retest method was 0.91.

Validity is defined as the usefulness or appropriateness of the inferences made from the test scores (Gall et al., 2007). In short, test validity hinges on if the test measures what the test reports that it measures. The construct validity of STAR Reading® was reported as 0.96 (Renaissance Learning, 2015). Concurrent validity data was collected from administrations from spring 1999 – spring 2013. The concurrent validity coefficients for grades 1-6 (within-grade average) was 0.74 with a range of 0.72 – 0.80 (Renaissance Learning, 2015). The average predictive validity coefficient for grades 1-6 was 0.71 with a range of 0.69 - 0.72 (Renaissance Learning, 2015). According to Renaissance Learning (2015), a meta-analysis of the STAR Reading® validity data was conducted and yielded the conclusion that the overall estimate of the validity of STAR Reading® is approximately 0.78, with a standard error of 0.001.

The STAR Reading® test yields a zone of proximal development (ZPD) score for each student to assist the teacher in selecting appropriately leveled materials. The STAR Reading® test also yields a growth score when the test is administered at least twice during a school year. This test was administered at the beginning of the school year and at the end of the school year; therefore, a growth score was calculated.

STAR Reading® is a timed response test with standard time limits for grades K-2 at 60 seconds per item, vocabulary-in-context, and grades 3-12 with 45 seconds for vocabulary-in-context items and 90 seconds for authentic text/passage comprehension items (Renaissance Learning, 2015, p. 13). Students in grades K-2 receive 25 vocabulary-in-context items while students in grades 3-12 received 20 vocabulary-in-context items and five authentic text passages with multiple-choice literal or inferential questions. The use of Adaptive Branching ensures that each student receives questions based upon his current level of proficiency. Overall, students in grades K-2 have up to 25 minutes to complete the test. Students in grades 3-12 have up to 23 minutes to complete the test. STAR Reading® reports included scores for Grade Equivalent, Percentile Ranking, Growth, Normal Curve Equivalent, Lexile Measures®, and Scaled Scores. Scaled scores range from 0 – 1,400 (Renaissance Learning, 2015). A scaled score of 0 is the lowest possible score meaning that the student answered no questions correctly and a score of 1,400 is the highest possible score meaning that the student answered every question correctly.

Renaissance Learning® provides instructions in the STAR Reading® Technical Manual for the administration of STAR Reading® assessment. Test administrators are encouraged to remove any information from the testing room that may distract the students during the test session or that may assist the student in answering questions. The test instructions include a brief description of the test to inform the students what to expect. This brief description includes

information such as the number of test items and the estimated length of the assessment. Students are encouraged to do their best and that every test is different; therefore, some students may finish before others. Students must answer two practice questions in order to begin the test.

Procedures

Approval from the school system's superintendent was obtained July 22, 2015 (see Appendix A). An application seeking approval of the Liberty University Institutional Review Board (IRB) (see Appendix B) to conduct this study was submitted on October 30, 2018. Once IRB granted approval on November 7, 2018, the school superintendent was notified of IRB's approval. Each elementary gifted specialist was contacted via email requesting the necessary data for this study. Information concerning the study including directions, procedures, and a timeline was provided to the gifted specialists involved in the study.

The STAR Reading® reports were requested on November 7, 2018. Each gifted specialist at a school was asked to obtain the Full-time Equivalency Report (FTE) from the Data Specialist of the elementary school of all gifted students as submitted to the State of Georgia for the 2014-2015 school year. Upon receipt of the STAR Reading® reports from the principal or his designee, they were to verify that there was a report for each identified and served gifted student for the year 2014-2015 according to the FTE reports. Once roster verification was completed, the gifted specialist coded each student according to his/her reading instruction; HO for homogeneously grouped for reading instruction and HE for heterogeneously grouped according to the directions provided (see Appendix C). The researcher communicated with each of the gifted specialists either by email, phone, or face-to-face for the purpose of answering general questions, as well as specific questions as how to identify students as being either homogeneously grouped for reading instruction or heterogeneously grouped for reading

instruction. After all students were coded, the gifted specialists confirmed the coding with the reading teacher and then redacted all identifying student data leaving only a student number. Data began being received on November 12, 2018 with all data received by November 26, 2018. Two gifted specialists sent a hard copy of the data to the researcher via the interagency mail system, while the other two gifted specialists delivered the data by hand. Once received, the data were kept in a secure file cabinet when not in use. Data were input into an Excel file and then uploaded into SPSS. The files required a password and fingerprint access, for analysis procedures.

Data Analysis

There were three questions that guided this study. An analysis of covariance (ANCOVA) was used for RQ1 to determine if there was a significant difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement. An ANCOVA was appropriate because it tests the main and interaction effects of categorical variables on a continuous dependent variable, controlling for the effects of a variable which may co-vary with the dependent variable (Gall et al., 2007; Warner, 2013).

A paired samples *t*-test was conducted for RQ2 to determine if a difference existed between the means of pre- and posttest reading scores of students who were homogeneously grouped for reading instruction. A paired samples *t*-test was also used to test for a difference among students who were heterogeneously grouped for reading instruction in RQ3. Paired samples *t*-tests are appropriate when looking at differences between the means of two variables for the same subject (Gall et al., 2007; Warner, 2013).

Preliminary Data Screening and Assumption Testing

All data were screened for missing data or inconsistencies and outliers. Input of data were checked visually in Excel for missing data and inconsistencies. Outliers were checked with a Box and Whisker plot. For this study, the alpha was set at $\alpha = 0.05$ to determine if the null hypotheses could be rejected. Additionally, assumption testing was conducted for both the paired samples *t*-tests and ANCOVA. For both analyses, it was determined that the dependent variable was measured on the interval, the observations within each variable were independent, and the sample was assumed to be a random sample from the population. Furthermore, the assumptions of normality were tested using a Kolmogorov-Smirnov test of normality and a Levene's Test for Equality of Variance showing population distributions were normal and of the same variance. For the ANCOVA, additional assumptions were tested. A series of scatter plots were used to determine linearity between the pre-test variable and the post-test variable in each group, bivariate normal distribution, and homogeneity of slope. A partial eta squared (η_p^2) was used to determine effect size (Gall et al., 2007). For all three hypotheses, results from assumption testing are reported in Chapter Four.

Descriptive statistics, group means, and standard deviation for groups are also provided in Chapter Four. Consistent with reporting requirements of an ANCOVA and paired samples *t*-tests, all findings to include degrees of freedom, observed *t* and F-values, and significance level are included in Chapter Four.

CHAPTER FOUR: FINDINGS

Overview

Gifted programs are not increasing the achievement of gifted students (Adelson, McCoach, & Gavin, 2012). Time spent in class is not the same as time spent learning, being actively engaged, or participating in critical thinking activities (Halpern, 2013; Makel M. C., Wai, Putallaz, & Malone, 2015). The purpose of this causal-comparative study was to determine if there was a difference between the reading achievement scores of elementary gifted students by grouping controlling for prior achievement and within grouping. This chapter contains the findings as relevant to the data analyses. The results include the descriptive statistics as well as inferential statistics. The results of assumption testing are also included.

Research Questions

There were three research questions for this study:

RQ1: Is there a significant difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement?

RQ2: Is there a significant difference between homogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

RQ3: Is there a significant difference between heterogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment?

Null Hypotheses

There were three null hypotheses:

H_{01}: There is no significant difference in STAR Reading® scores between gifted elementary students who are homogeneously grouped for reading instruction and gifted elementary school students who are heterogeneously grouped for reading instruction controlling for prior achievement.

H_{02}: There is no significant difference between homogeneously grouped gifted elementary school students' pretest and posttest scores on the STAR Reading® assessment.

H_{03}: There is no significant difference between heterogeneously grouped gifted elementary school students' pretest and posttest scores STAR Reading® assessment.

Descriptive Statistics

Data for the descriptive statistics are described in Table 4.1, which provides unadjusted mean, number, and standard deviation for homogeneously grouped gifted students and heterogeneously grouped reading students. The unadjusted mean for the homogeneously grouped gifted students was $M = 723.40$ ($n = 84$, $SD = 226.20$). The unadjusted mean for the heterogeneously grouped gifted students was $M = 661.20$ ($n = 35$, $SD = 185.10$). The STAR Reading® assessment yields a score with a range between zero and 1,400 with zero being the lowest possible score and 1,400 being the highest possible score.

Table 4.1

Unadjusted Means for Homogeneously Grouped and Heterogeneously Grouped Students

Group	*N*	Mean	Std. Deviation
Homogeneous	84	723.40	226.20
Heterogeneous	35	661.20	185.10
Total	119	705.10	216.00

The adjusted means and standard error are presented in Table 4.2 with the homogeneously grouped gifted students having an adjusted mean of *M* = 699.59 with a standard error of 13.47 and the heterogeneously grouped gifted students having an adjusted mean of *M* = 716.92 and a standard error of 22.00. Descriptive statistics for both adjusted means and unadjusted means are presented in Table 4.3.

Table 4.2

Adjusted Means by Grouping

			95% Confidence Interval	
Group	Mean	Std. Error	Lower Bound	Upper Bound
Homogeneous	699.59	13.47	672.91	726.26
Heterogeneous	716.92	22.00	673.34	760.51

Table 4.3

Adjusted and Unadjusted Means by Grouping

		Unadjusted		Adjusted	
	N	*M*	*SD*	*M*	*SD*
Homogeneous	84	723.39	226.18	699.59	13.47
Heterogeneous	35	661.23	185.14	716.92	22.00

The STAR Reading® assessment yields a score from a minimum of zero up a maximum of 1,400. Table 4.4 includes the descriptive statistics of the STAR Reading® assessment by elementary school. School A had a mean of $M = 409.63$ ($SD = 135.81$) for gifted students who were homogeneously grouped for reading instruction. School A had a mean of $M = 642.00$ ($SD = 251.59$) for gifted students who were heterogeneously grouped for reading instruction. School B had a mean of $M = 757.75$ ($SD = 169.69$) for gifted students who were homogeneously grouped for reading instruction. School B had a mean of $M = 678.20$ ($SD = 258.20$) for gifted students who were heterogeneously grouped for reading instruction. School C had no gifted students who were homogeneously grouped for reading instruction. School C had a mean of $M = 681.76$ ($SD = 206.22$) for gifted students who were heterogeneously grouped for reading instruction. School D had a mean of $M = 755.23$ ($SD = 239.57$) for gifted students who were homogeneously grouped for reading instruction. School D had a mean of $M = 623.60$ ($SD = 86.83$) for gifted students who were heterogeneously grouped for reading instruction.

Table 4.4

Descriptive Statistics by Grouping and School

School	Homogeneous			Heterogeneous		
	M	*N*	*SD*	*M*	*N*	*SD*
School A	409.63	8	135.81	642.00	3	251.59
School B	757.75	36	169.69	678.20	5	258.20
School C	-	-	-	681.76	17	206.22
School D	755.23	40	239.57	623.60	10	86.83

At the time of the pretest, 35 of the 119 students (29%) were reading below grade level, 25 students (21%) were reading on grade level, and 59 students (50%) were reading above grade level, which means 50% of the students in this study were reading on or below grade level at the time of the pretest. At the time of the posttest, 35 students (29%) were reading below grade level, with 10 students (8%) reading on grade level, and 74 students (62%) reading above grade level. The mean scores for the pretest and posttest show improvement in both groups (see Tables 4.5 & 4.6).

Table 4.5

Pretest and Posttest Means and Standard Deviations

	Homogeneous		Heterogeneous	
	M (*N*)	*SD*	*M (N)*	*SD*
Pretest	636.08 (84)	217.38	486.90 (35)	215.67
Posttest	723.39 (84)	226.18	614.05 (35)	200.53

Table 4.6

Reading Levels of Students at the Time of the Pretest and Posttest

	Below Grade Level	On Grade Level	Above Grade Level
Pretest	35 (29%)	25 (21%)	59 (50%)
Posttest	35 (29%)	10 (8%)	74 (62%)

Results

This section will provide results by hypothesis statement. For each null hypothesis, the results for the assumption testing will be given first, and then the results for the main analysis.

Null Hypothesis One

A one-way ANCOVA was used to compare the mean differences between gifted students who were heterogeneously grouped for reading and gifted students who were homogeneously grouped for reading. This section includes a description of the tests used to ensure that the data met the assumptions of the one-way ANCOVA, as well as the results of the analysis of the research hypotheses.

Data screening results for ANCOVA. Data were screened for outliers and inconsistencies. Two data points were determined to be outliers as assessed by boxplot (see Figure 1). Those data points were widely separated from the rest of the data (Howell, 2008). Those data were included as they were not considered significant.

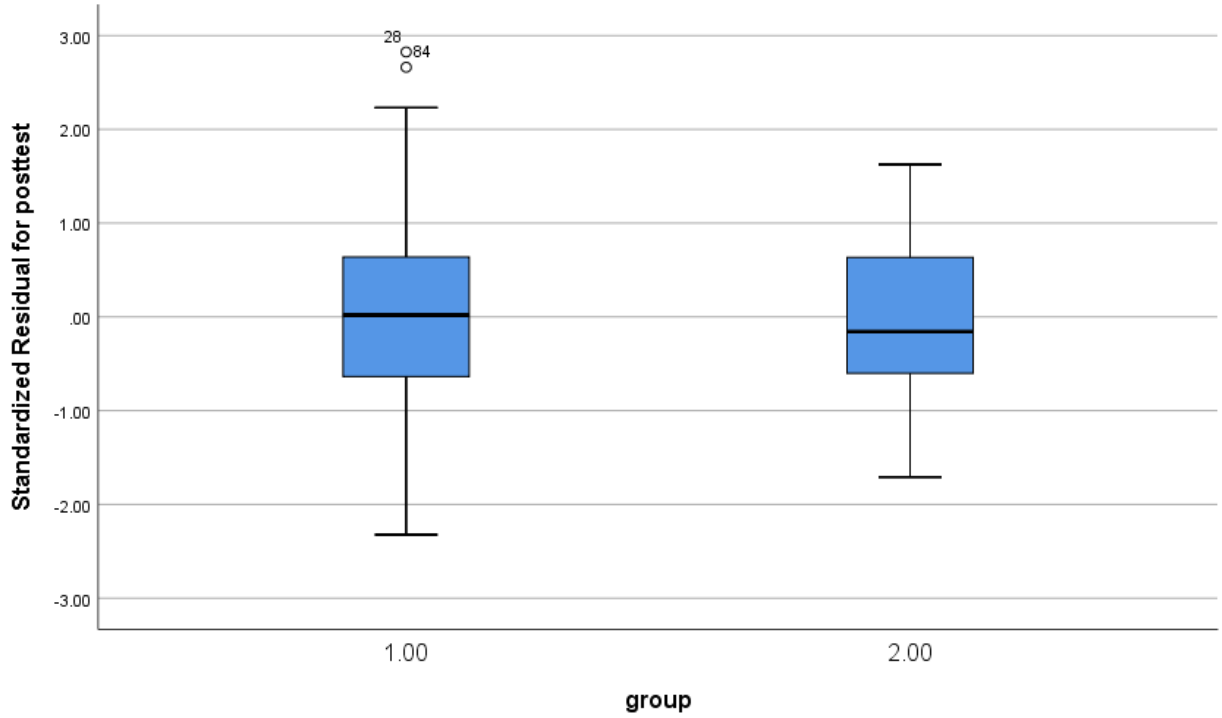

Figure 4.1. Box plot of the reading achievement by grouping.

Assumption testing for ANCOVA. The assumption of linearity was met as determined by a visual inspection of the scatterplot (Figure 4.1). There was homogeneity of regression of slopes as the interaction term was not statistically significant $F(1,115) = 0.028$, $p = 0.87$, wherein $p > 0.05$ (Figure 4.2). Assessed using a Kolmogorov-Smirnov Test of Normality, the standardized residuals for the interventions were normally distributed as $p > 0.05$ as presented in Table 4.7.

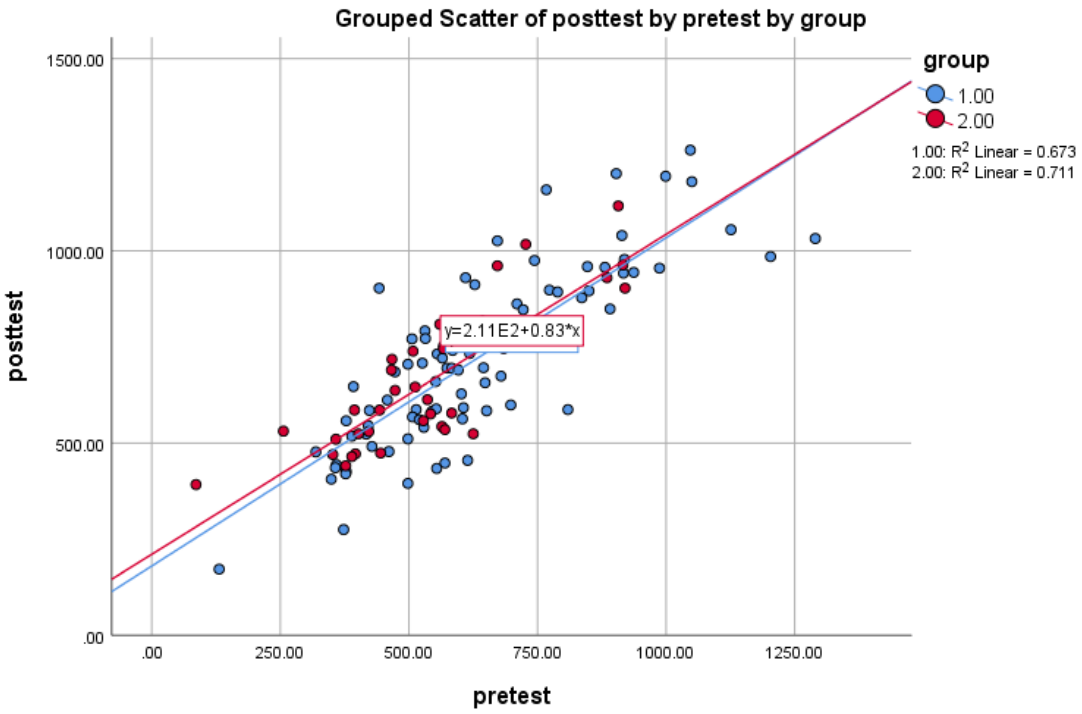

Figure 4.2. Scatterplot for the assumption of linearity.

Table 4.7

Tests of Normality

		Kolmogorov-Smirnov[a]		
	Group	Statistic	df	Sig.
Standardized Residual for posttest	1	0.072	84	0.200*
	2	0.108	35	0.200*

Note: Group 1 = Homogeneously Grouped; Group 2 = Heterogeneously Grouped

There was homoscedasticity as assessed by visual inspection of the standardized residuals as plotted against the predicted values (Figure 4.3).

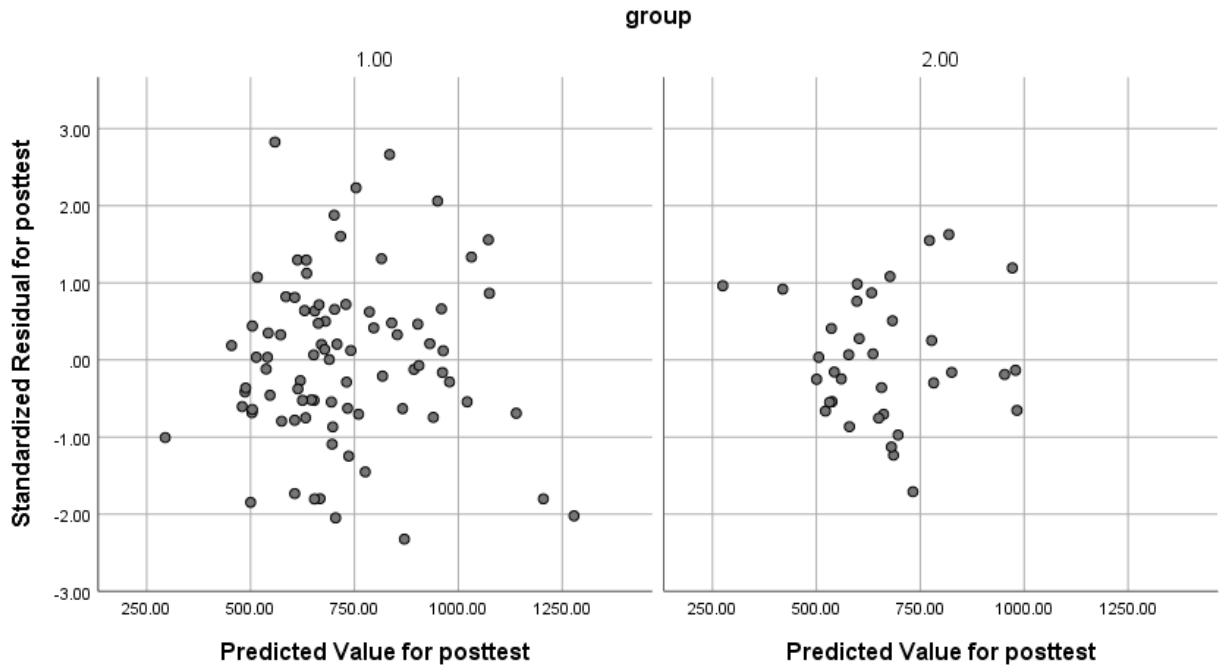

Figure 4.3. Scatterplot for assumption of homoscedasticity.

There was homogeneity of variances, as assessed by Levene's Test for Equality of Variances (p = 0.36) as seen in Table 4.8.

Table 4.8

Levene's Test of Equality of Error Variances

Levene's Test of Equality of Error Variances[a]

Dependent Variable: posttest

F	df1	df2	*P*
1.683	1	117	0.197

Tests the null hypothesis that the error variance of the dependent variable is equal across groups. a. Design: Intercept + pretest + group

ANCOVA results. A one-way ANCOVA was conducted to test null hypothesis one which stated:

H_{01}: There is no difference in STAR Reading® scores between gifted elementary students who are grouped homogeneously or heterogeneously for reading instruction.

The ANCOVA was used to control for initial differences between groups before comparisons within-groups variance and between-groups variance is made (Gall, et al., 2007). The effect of the ANCOVA was to make the two groups, homogeneously grouped for reading instruction and heterogeneously grouped for reading instruction, equal with respect to the control variable. The pretest scores were the covariate factor, the posttest was the dependent variable, and STAR® Reading Assessment was the fixed factor.

The one-way ANCOVA yielded results of $F(1, 116) = 0.47$, $p = 0.467$, $\eta_p^2 = 0.005$. There were no statistically significant differences between the adjusted group means of the homogeneously grouped gifted students and the adjusted group means of the heterogeneously grouped gifted students in reading achievement; therefore, the researcher failed to reject the null hypothesis (see Table 4.9). Inasmuch, there is no need to explain the effect size. Furthermore, as there were only two categories in the independent variable, there was no need to run post-hoc tests.

Table 4.9

ANCOVA Results

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	*F*	*p*	Partial Eta Squared
Corrected Model	3783473.12[a]	2	1891736.56	127.34	.00	.687
Intercept	476872.77	1	476872.77	32.10	.00	.22
pretest	3687999.75	1	3687999.75	248.25	.00	.68
group	7929.45	1	7929.45	.53	.47	.01
Error	1723300.46	116	14856.04			
Total	64671080.00	119				
Corrected Total	5506773.58	118				

a. R Squared = .687 (Adjusted R Squared = .682)

Null Hypothesis Two

A paired samples *t*-tests was used to determine whether the mean difference between two observations, pretest and posttest, was statistically significant for the homogeneous group.

Data screening for paired samples *t*-tests. Data were screened for outliers and inconsistencies. There were no significant outliers in the differences between the two groups, as assessed by no cases with standardized residuals ± 3 standard deviations.

Assumption testing for paired samples *t*-test. The paired-samples *t*-test has four assumptions. The first assumption was met as there is one dependent variable, STAR® Reading assessment that is measured at the continuous interval level, which is zero to 1,400. Assumption two was met as each independent variable, homogeneously grouped and heterogeneously grouped, has two related groups, pretest scores and posttest scores. Assumption three was met as there were no significant outliers in the differences between the two groups, as assessed by no cases with standardized residuals ± 3 standard deviations. The difference scores for the homogeneously grouped students for reading instruction were normally distributed, assessed using Shapiro-Wilk's test ($n < 50$ for each group) ($p = 0.69$) (see Table 4.10).

Table 4.10

Tests of Normality for the Homogenous Group

	Shapiro-Wilk		
	Statistic	df	Sig.
difference	0.99	84	0.69

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Results for Null Hypothesis Two. A paired-samples *t*-test was used to test Null Hypotheses Two which stated:

H_{02}: There is no significant difference between homogeneously grouped gifted elementary students' pretest and posttest scores on the STAR Reading® assessment.

The paired-samples *t*-test was used to determine if the mean difference between the homogeneously grouped gifted students for reading instruction was statistically significantly different from zero. In order to conduct a paired-samples *t*-test, the participants must have been

tested at two times on the same variable. In this study, the homogeneously grouped gifted students were administered the STAR® Reading assessment as a pretest and a posttest.

For the homogeneously grouped gifted students for reading instruction, the paired-samples *t*-test yielded the following results. The posttest has an increase of 87.31 (95% CI, 58.43 to 116.19) as compared to the pretest (see Table 4.11). The posttest scores yielded a statistically significant increase as compared to the pretest, t (83 = 6.012, $p < 0.001$, $d = .656$ (see Table 4.11). There was a statistically significant difference between means ($p < 0.05$); therefore, null hypothesis two was rejected.

Table 4.11

Paired Samples Test for the Homogeneous Group

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	posttest - pretest	87.31	133.09	14.52	58.43	116.19	6.01	83	.00

Null Hypothesis Three

A paired samples *t*-tests was used to determine whether the mean difference between two observations, pretest and posttest, was statistically significant for the heterogeneous group.

Data screening for paired samples *t*-tests. Data were screened for outliers and inconsistencies. There were no significant outliers in the differences between the two groups, as assessed by no cases with standardized residuals ± 3 standard deviations.

Assumption testing for paired samples *t*-test. The paired-samples *t*-test has four assumptions. The first assumption was met as there is one dependent variable, STAR® Reading assessment that is measured at the continuous interval level, which is zero to 1,400. Assumption two was met as each independent variable, homogeneously grouped and heterogeneously grouped, has two related groups, pretest scores and posttest scores. Assumption three was met as there were no significant outliers in the differences between the two groups, as assessed by no cases with standardized residuals ± 3 standard deviations. The difference scores seen in Table 4.12 for the heterogeneously grouped students for reading instruction were normally distributed, as assessed by Shapiro-Wilk's test ($p = 0.574$).

Table 4.12

Tests of Normality for the Heterogenous Group

	Shapiro-Wilk		
	Statistic	df	Sig.
difference	0.97	35	0.57

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Paired samples t-test results. A paired-samples *t*-test was used to test Null Hypotheses Three which stated:

H_{03}: There is no significant difference between heterogeneously grouped gifted elementary students' pretest and posttest scores on the STAR Reading® assessment.

The paired-samples *t*-test was used to determine if the mean difference between the heterogeneously grouped gifted students for reading instruction was statistically significantly different from zero. In order to conduct a paired-samples *t*-test, the participants must have been tested at two times on the same variable. In this study, the heterogeneously grouped gifted students were administered the STAR® Reading assessment as a pretest and a posttest.

The paired-samples *t*-test yielded the following results for the heterogeneously grouped gifted students for reading instruction. The posttest has an increase of 119.94 (95% CI, 84.10 to 155.78) as compared to the pretest (see Table 4.13). The posttest scores yielded a statistically significant increase as compared to the pretest, t (34 = 6.01, $p < 0.001$, $d = 1.15$. There was a statistically significant difference between means ($p < 0.05$); therefore, null hypothesis three was rejected.

Table 4.13

Paired Samples Test for the Heterogeneous Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	posttest - pretest	119.94	104.33	17.64	84.10	155.78	6.80	34	.00

Summary

Data screening was completed for the ANCOVA which determined there were two non-significant outliers in the data; however, as the outliers were non-significant, they were not removed. All assumptions were found tenable. The results of the ANCOVA for this causal-comparative study showed that there was no significant difference between the elementary gifted students reading achievement who were homogeneously grouped for reading instruction as compared to the gifted students who were heterogeneously grouped for reading instruction. As such, Null Hypothesis One was not rejected.

Data screening was completed for the paired samples *t*-test for Null Hypothesis Two and Null Hypothesis Three which determined there were no outliers in the data as assessed by no cases with standardized residuals ± 3 standard deviations. All assumptions were tenable. The results of the paired samples *t*-tests showed that there were statistically significant differences between the means of the homogeneous group (pre- and posttest) and the heterogeneous group

(pre- and posttest); therefore, both Null Hypothesis Two and Null Hypothesis Three were rejected.

CHAPTER FIVE: CONCLUSIONS

Overview

Gifted programs are not increasing the achievement levels of gifted students (Adelson et al., 2012). In addition, teachers in the general education classrooms rarely modify their instructional practices to meet the needs of the gifted students (Shaunessy-Dedrick et al., 2015). Gifted students need programs and curriculum that meet their needs in order for them to reach their full potential (Siegle, et al., 2016). The purpose of this causal-comparative study was to determine if there is a difference between the reading achievement scores of elementary gifted students by grouping. Chapter Five contains the discussion of the study with implications, limitations, and recommendations for future research.

Discussion

The one-way ANCOVA yielded insignificant results of $F(1, 116) = .467$, $p = 0.467$, which means that there were no statistically significant differences between the reading achievement of elementary gifted students who were homogeneously grouped for reading instruction as compared to elementary gifted students who were heterogeneously grouped for reading instruction. While the results of this study show that there were no statistically significant differences in the reading achievement scores of gifted students who were homogeneously grouped as compared to those that were heterogeneously grouped, Collins and Gann (2013) found that students who were homogeneously grouped, whether by high ability or low ability, performed better than those that were heterogeneously grouped. Studies have shown that homogeneously grouping students by ability provides positive outcomes (Ford, 2015; Gentry, 2014; NAGC, 2009; NASP, 2005; Slavin, 1987; Steenbergen-Hu, Makel, and Olszewski-Kubilius, 2016; Van Tassel-Baska, 2007).

There are possibly several reasons that no significant differences were found in this study due to the use of archival data. Using archival data prevented the researcher from ensuring that the STAR Reading® assessment was administered to all students following the same protocols, which would ensure consistency of test administration according to the guidelines and norming procedures. Due to using archival data, this study did not consider teacher experience, class size (Vogl & Preckel, 2014), and motivation of the gifted students. The large standard deviations in some groups were a result of having negative scores, which means that the student achieved a lower level on the posttest than on the pretest. The posttest scores were unable to be evaluated for a trend because that information was unavailable due to the use of archival data.

The paired sample t-test results yielded significant differences for both the homogeneously grouped and the heterogeneously grouped students; however, the small sample size of the heterogeneous group severely restricted the ability to determine if there were or were not significant results. The population was 157 gifted elementary students with a sample size of 119 students in grades two through five. Once the scores were coded the groups were uneven. It was impossible to balance the groups and still maintain enough participants to conduct the study. The homogeneously grouped students for reading instruction had a sample size of $n = 84$ and the heterogeneously grouped students for reading instruction had a sample size of $n = 35$. It was also impossible to add additional participants to the study as this study used archival data.

The use of unequal groups can be problematic in any study. The purpose of equivalence testing is to provide evidence that the groups are comparable by proving that the mean differences between the two groups are small enough to be considered inconsequential to the outcome of the study (Rusticus & Lovato, 2014). When controlling sample size is not possible, Rusticus and Lovato (2014) recommend collecting as much data as possible and then consider

lowering the power to below 0.95, which would require less data for the study. This would usually allow the researcher to create equal groups; however, lowering the power to below 0.95 was not an acceptable option for the researcher.

Implications

The implications section includes three sections discussing how the implications of this study impact the empirical, theoretical, and practical applications of the results. The empirical section discusses how the related research supports implications. The theoretical section describes how the theories of Piaget and Vygotsky apply to the implications. The practical section describes implications that may guide educational leaders, administrators, and teachers in applying pragmatic solutions.

Empirical Implications

The needs of gifted students have been lost in the greater push toward educational improvement, which has focused on getting the low performing students to proficiency. The 1993 U.S. government report, "National Excellence: A Case for Developing America's Talent," stated that the United States was "squandering one of its most precious resources -- the gifts, talents, and high interests of many of its students" (p.1). The ESEA of 1965 provided a full educational opportunity for all students but lacked any type of accountability system (U.S. Department of Education, 2016).

The NCLB of 2001 focused on getting the low performing subgroups to proficiency, which resulted in the majority of the teachers' time, focus, and energy being spent on helping low performing students and very little time, focus, or energy was given to the gifted students (Jolly & Matthews, 2018; Smith & Arthur-Kelly, 2016), thereby creating an excellence gap

(Plucker et al., 2010). During the era of NCLB, the academic gains of gifted students declined (Assouline et al., 2015).

The ESSA of 2015 required the collecting of data on all subgroups including gifted students; however, little has changed as gifted students had no representation in the rule-making committee which resulted in no mention of above grade level achievement or the importance of learning growth for all students (Plucker, et al., 2017). Due to ignoring the educational needs of gifted students, the United States is in an educational crisis, but this is no ordinary crisis with a quick mobilization to resolve the issues. No, this is a quiet crisis, which is going virtually unnoticed by most Americans (Duke TIP, 2015).

Theoretical Implications

The Cognitive Development Theory of Piaget (1953/2006) and the Social Development Theory of Vygotsky (1978) influenced this study. Piaget's theory recommended that students learn in developmentally appropriate ways. For gifted students this means providing them with learning opportunities that are designed for their proficiency level instead of their chronological age (Sahin & Levent, 2015). Since gifted students pass through the different levels of Piaget's theory faster than their peers, gifted students developmental needs will be different than their peers. Both acceleration and grouping gifted students in a homogeneous setting for instruction meets the needs of gifted students in accordance with Piaget's theory.

Vygotsky (1978) recommended that students learn within their range of independent learning and their need for adult assistance, which is the zone of proximal development (ZPD). Gifted students in a homogenously grouped class for instruction would be learning within their ZPD; therefore, they would receive the appropriate level of challenge, thereby meeting their educational needs. Without the appropriately challenging lessons in school, the time spent in

school does not reflect actual time learning (Makel et al., 2015). The time spent in class in this situation equates to nothing more than seat time.

Practical Implications

Gifted programs are not providing the types of services needed to meet the needs of gifted students so that they may reach full potential, and 41.5% of systems surveyed about their elementary school gifted programs plan to make no changes (Callahan, Moon, & Oh, 2014). Just as students in the special education programs have specific needs, so do gifted students, and both groups need educational opportunities based upon their needs to reach their full potential. Educators need to continue to investigate grouping methods that allow elementary gifted students to excel in reading because previous research shows positive results for grouping gifted students for instruction (Bui et al., 2014; Coleman, 2016; De Corte, 2013; Gentry, 2014; Gentry, 2016; Potts, 2019; Steenbergen-Hu et al., 2016). Administrators and teachers should consider the grouping of elementary students in reading as an effective method of instruction so that gifted students can identify with like ability peers as well as receive more challenging work (Adelson & Carpenter, 2011; Bui et al, 2014; Chu & Myers, 2015; Coleman et al., 2015; Collins & Gan, 2013; Kitsantas et al., 2017; Roessingh & Bence, 2017).

Limitations

This study used self-reporting of teachers to determine the grouping of the students. Self-reporting is not always accurate or reliable due to the many factors able to influence the reporting, such as teachers lacking the understanding of how to correctly identify their grouping practices, guilt related to their practice, denial of their practices, or recall bias (Mirzaei-Alavijeh, et al., 2018; Ross, McDougall, Hogaboam-Gray, & LeSage, 2003). Some teachers may have reported their classes as homogeneously grouped because they provided differentiated instruction

occasionally. Gifted specialists were instructed how to code the students as being homogeneously or heterogeneously grouped for reading instruction. The gifted specialist discussed with each teacher the grouping practices that the teacher employed in teaching reading to gifted students. The gifted specialists then reported the teachers as either homogeneously grouped or heterogeneously grouped for reading instruction. Having the gifted specialists code the students' grouping was done to help eliminate the possibility of errors in self-reporting; however, this could have had a reverse effect since the gifted specialist and the teachers in each school are colleagues. Incorrectly reporting the grouping of the students, whether intentionally or unintentionally, could impact the results of the study. To increase the likelihood that each student was properly coded as being homogeneously or heterogeneously grouped for reading instruction, the researcher could have interviewed each teacher and possibly reviewed lesson plans to determine the most likely grouping.

Due to the use of archival data, it was impossible to control for teacher experience, teacher certification, instructional strategies, and sample size. Also, not all classes in a grade level within each school grouped in the same manner. Some schools used ability grouping throughout the grade level for the teaching of reading, while others cluster grouped the students into a couple of classes, and still others spread the gifted students evenly among all of the teachers in the grade level. The two groups (homogeneous and heterogeneous) were unequal. Unequal groups can be problematic in a study. The small sample size was particularly problematic for the heterogeneous grouped students for reading instruction. The small sample size resulted in an inability to determine if there were or were not significant results for that group.

Another limitation of the study is the decrease in posttest scores as compared to pretest scores. There were 22 students (18%) with lower scores on the posttest than on the pretest. Of those 22 students, 17 of the scores were in the homogeneous group and five were in the heterogeneous group. According to Renaissance Learning (2018), the STAR Reading® assessment has a standard error of measurement (SEM) of approximately 57 points. Upon evaluation of the scores, it was determined that eight of the 22 scores were within the SEM. The remaining 14 scores (12%), of which seven were from female students and seven were from male students, were not within the SEM. Test score fluctuations can be caused by many different external factors such as testing environment, validity of the testing protocol, length of time the student tested, the physical or emotional state of the student at the time of testing (Renaissance Learning, 2018), or test anxiety. Elementary students are experiencing more test anxiety and lower self-concept in subject areas, which negatively impacts their test performance (Lohbeck, Nitkowski, & Petermann, 2016; Raccanello, Brondino, Moe, Stupnisky, & Lichtenfeld, 2019). Nonetheless, due to the insignificant results of the ANCOVA, it appears that the gifted students may lack the push that they need to excel.

Recommendations for Future Research

Future research should be conducted in a more controlled situation, perhaps one in which teacher experience, instructional methods, grouping, and testing could be verified and monitored throughout the study. The research overwhelmingly suggests that grouping is beneficial for gifted students (Bui et al., 2014; Coleman, 2016; De Corte, 2013; Gentry, 2014; Gentry, 2016; Steenbergen-Hu et al., 2016; Potts, 2019). More research is needed on grouping of elementary students for reading achievement. Future research should include the following:

1. Repeat the current study with a larger sample and controlling for such things as teacher experience, certifications, instructional methods, testing, and grouping. If the researcher controls for the placement of the students in homogeneously or heterogeneously grouped classrooms for reading instruction, there will be no need for self-reporting of teachers, which would eliminate one of the limitations. Ensuring that each teacher read from the STAR Reading® test administration script could yield more reliable results.
2. Repeat the current study with the aforementioned differences as well as including school systems from different areas of the state.
3. Conduct a longitudinal study which would measure the students' reading achievement over several years of the same grouping for reading instruction.
4. Conduct a similar study using a mixed methods approach to gain insight into the possible reasons beyond grouping that contribute to gains in reading achievement.

Summary

The purpose of this causal-comparative study was to determine if there was a difference between the reading achievement scores of elementary gifted students by grouping. Since giftedness is not a one-size-fits-all, educators must continually strive to provide the most effective instructional strategies to allow all gifted students the opportunity to reach their full potential each year. The one-way ANCOVA yielded insignificant results of $F(1, 116) = .467$, $p = 0.467$, which means that there were no statistically significant differences between the reading achievement of elementary gifted students who were homogeneously grouped for reading instruction as compared to elementary gifted students who were heterogeneously grouped for reading instruction.

The paired samples *t*-test for the homogeneously grouped gifted students for reading instruction, yielded the following results. The posttest has an increase of 87.31 (95% CI, 58.43 to 116.19) as compared to the pretest. The posttest scores yielded a statistically significant increase as compared to the pretest, t (83 = 6.01, $p < 0.001$, $d = .66$. The paired-samples *t*-test yielded the following results for the heterogeneously grouped gifted students for reading instruction. The posttest had an increase of 119.94 (95% CI, 84.10 to 155.78) as compared to the pretest. The posttest scores yielded a statistically significant increase as compared to the pretest, t (34 = 6.01, $p < 0.001$, $d = 1.15$. There was a statistically significant difference between means ($p < 0.05$).

While the results of this study contradict previous studies, which support the grouping of gifted students (Coleman, 2016; Collins & Gann, 2013; DeCorte, 2013; Gentry, 2014; Gentry, 2016; Kitsantas, Bland, & Chirinos, 2017; Potts, 2019; Siegle, et al., 2016), there are possibly several reasons that the ANCOVA for this study yielded no significant results. This study used archival data, which prevented the researcher from monitoring or verifying that the STAR® Reading assessment was administered to all students in the study using the same protocol. Due to the use of archival data, teacher experience, teacher certification, class size, and motivation of the gifted students were not considered. All four of the elementary schools provided gifted services through the resource model, which pulls-out the students from their regular classes one day each week.

Once the scores were coded the groups were uneven. The use of uneven groups can be problematic in any study. It was impossible to balance the groups and maintain enough participants to conduct the study and it was also impossible to add additional participants to the study as this study used archival data. The homogeneously grouped students for reading

instruction had a sample size of $n = 85$ and the heterogeneously grouped students for reading instruction had a sample size of $n = 34$.

The empirical implications include that the needs of gifted students have been lost in the focus to bring low performing students to proficiency, which has pushed the United States into a quiet crisis concerning the achievement of gifted students. This quiet crisis is going virtually unnoticed by most Americans (Duke TIP, 2015). In addition to the quiet crisis, the United States has an excellence gap due to recent school improvement initiatives such as NCLB of 2001 and ESSA of 2015 requiring no accountability of the growth or performance of gifted students.

The Cognitive Development Theory of Piaget (1953/2006) and the Social Development Theory of Vygotsky (1978) influenced this study, which resulted in the following Theoretical implications, gifted students should learn within their ZPD and learn in developmentally appropriate ways. While gifted students pass through the different levels of Piaget's theory faster than their peers, the gifted students' needs will be different from their peers. Piaget's theory supports the grouping of gifted students in a homogeneously setting as does Vygotsky's theory. This study will contribute to the theoretical base of literature.

The practical implications include the need for educators to continue to investigate grouping methods that allow elementary gifted students to excel in reading because previous research shows positive results for grouping students for instruction (Bui et al., 2014; Coleman, 2016; De Corte, 2013; Gentry, 2014; Gentry, 2016; Potts, 2019; Steenbergen-Hu et al., 2016). Administrators and teachers should consider the grouping of elementary students in reading as an effective method of instruction so that gifted students can identify with like ability peers as well as receive more challenging work (Adelson & Carpenter, 2011; Bui et al, 2014; Chu & Myers,

2015; Coleman et al., 2015; Collins & Gan, 2013; Kitsantas et al., 2017; Roessingh & Bence, 2017).

One of the limitations of this study was the use of self-reporting because self-reporting is not always accurate or reliable due to multiple factors that influence the reporting. Self-reporting can be done in error due to the teachers not fully understanding how to correctly identify their grouping practices. Teachers may also incorrectly self-report due to guilt related to their instructional practices or denial of their instructional practices. Whether intentionally or unintentionally, the reporting of the grouping of gifted students incorrectly could impact the results of this study. The use of archival data was also a limitation because it was impossible to control for other factors such as teacher experience, motivation of the students, and instructional strategies. The use of unequal groups was also a limitation in this study and it, too, was impossible to correct due to the use of archival data.

There are many options for repeating this study in future research. The study could be repeated using a larger sample group and without using archival data so that testing methods, teacher experience, and instructional strategies could all be controlled. This would eliminate the need for self-reporting, which would also eliminate one of the limitations.

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APPENDIX A

School System Permission to Participate

[redacted]

July 22, 2015

Amy E. London Doctoral Candidate

[redacted]

Dear Mrs. London:

After careful review of your research proposal The Difference Between Homogeneous Grouping and Heterogeneous Grouping in Gifted Students' Reading Achievement, I have decided to grant you permission to access all elementary gifted students' STAR Reading archival data from 2014-2015 for all elementary schools.

Please note the following:

Data will be provided to the researcher stripped of any identifying information.

I am requesting a copy of the results upon study completion and/or publication.

Sincerely,

[redacted]

APPENDIX B

Institutional Review Board Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

November 7, 2018

Amy E. London
IRB Application 3558: The Difference Between Homogeneous Grouping and Heterogeneous Grouping in Gifted Elementary Students' Reading Achievement

Dear Amy E. London,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because it will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

[redacted]

Administrative Chair of Institutional Research
The Graduate School

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APPENDIX C

Instructions for Gifted Specialists

Gifted Reading Achievement Study 2014-2015

You may need to make inquiries of the reading teachers for the gifted students to verify the grouping of the gifted students. Teachers usually remember quite well the gifted students they have taught. You may need to reassure the teachers that this is not a "got cha," has no bearing whatsoever on them, their abilities, or their effectiveness as a teacher. This is merely a study to determine the best way to group elementary gifted students for reading instruction.

Directions for redacting personally identifying information and grouping the students.

** Before beginning this process, please make a copy of the reports. The reports with the identifying information must be kept securely at your school. In the event that the data becomes corrupted during analysis, you may need to confirm some of it, so please keep an original copy of the data and then a copy of the coded and redacted data that you will send to me.

1.) Each student must be classified according to how he/she received reading instruction the majority of the time… either homogeneously grouped or heterogeneously grouped. Follow the guidelines below for determining the grouping.

a. Homogeneously Grouped is defined as receiving reading instruction with like-ability peers. Students in this group should be coded as HO.

i. This could be in a classroom in which the students are all gifted and grouped with like-ability peers (high achievers). In this situation, the students should receive reading instruction on their level, above their level, or near their level. It is impossible to have an entire classroom on the same level. It is equally impossible to teach each student reading on his/her individual level. So, sometimes the reading material would be above some of the gifted students' levels, on some of their levels, and near the levels of others. The big idea here is that the teacher consciously and intentionally provided reading instruction/materials at a higher level than grade level.

ii. This could be in a heterogeneous classroom in which the students are grouped for reading instruction by levels whereas all of the like-ability readers are all together in one group AND receive reading instruction/material as above. The big idea here is

that the teacher consciously and intentionally provided reading instruction/materials at a higher level than grade level for this group of students.

b. Heterogeneously Grouped is defined as receiving reading instruction in a mixed-ability classroom wherein the instruction was on various levels with no intentional effort being made to teach/instruct the gifted students on their instructional/reading level. Students in this group should be coded as HE.

i. This would be in a heterogeneous classroom where the teacher selects reading material for the lessons NOT based on reading level; therefore, the reading materials vary in level. (Example: consistent use of a basal textbook)

ii. This would also be a classroom in which the gifted students were NOT placed in groups with like-ability peers. This could be a classroom in which the teacher used the grade level material for reading instruction because the gifted students read AR books on their level.

iii. Every student received the same level or same text without regard to reading level.

** The big idea here is that there was no conscious or intentional effort to provide reading instruction or reading material for reading class on the level of gifted students.

**Make a copy

2.) Once each student has been coded, please black out his/her name. Replace the student name with his/her lunch number if it is not already on the report. Make a copy of this so that the student names cannot be identified.

3.) Secure this data.

Thank you so very much for your assistance. If you have questions about any of this, please ask. I have tried to think of every situation, but I am sure that I have not done so. Coding the students as HO or HE is important, but a little tricky in some situations. So, please email or call if you have any questions or run into any problems.

Thanks again!

Amy

APPENDIX D

Directions, Procedures, Timeline for Data Collection

Directions:

1. Obtain the STAR Reading® Test Record Reports from the gifted specialist.

Procedures:

1. Each student will be coded as follows:
    a. HO for those students who received reading instruction in a homogeneously grouped reading class.
    b. HE for those students who received reading instruction in a heterogeneously grouped reading class.
2. All names will have been redacted leaving only ID numbers.

Timeline:

1. IRB approval received November 7, 2018
2. Receive first data from gifted specialists by November 26, 2018