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A Study Comparing Academic Achievement in Reading of Gifted Students in Homogeneous and Heterogeneous Grouped Settings

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A Study Comparing Academic Achievement In Reading

Of Gifted Students In Homogeneous And

Heterogeneous Grouped Settings

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Abstract

This is a quantitative study using archival data to focus on the achievement of students identified as gifted and talented in four schools in the Midwest in the same district. This study attempted to find if differences in student reading performance existed between 27 students identified as gifted that were placed in a homogeneous classroom compared to those placed in heterogeneous classrooms. The researcher used the Measure of Academic Progress (MAP) data from 2010 to 2014 in reading growth scores. The independent variable is heterogeneous and homogenous grouping classification and the dependent variables are all continuous and consist of the aggregate student achievement (MAP) growth scores in reading. Overall the homogeneous did not show a continuous amount of growth compared individually to the other three schools over a four-year period, but showed the greatest amount of growth from 2011 to 2014.

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Chapter I: Introduction to the Problem

How is public education meeting the needs of gifted learners at the elementary level? A more specific question is this: Does public education meet the needs of gifted learners by providing academic challenge and rich classrooms that allow gifted learners to excel in an environment that promotes their natural abilities? As Martin (2006) noted, public education has focused on how to improve education for lower achieving students, which has resulted in public education failing gifted children who need to investigate creative solutions to problems and research topics based on their interest.

According to Sisk and Novello (2009), giftedness refers to students who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, and who need differentiated services and activities in order to fully develop those capabilities. Development of these gifts does not end with addressing this high achievement capability. Eddles-Hirsh, Vialle, Rogers, and McCormick (2010) noted: "Years of academic neglect may not only impinge on talent development, but may also impact the social and emotional development of the gifted child" (p. 108).

While the system, the schools, and the gifted programs themselves are all important in development, it is often the teachers who make the difference with gifted students. Extremely effective teachers understand that gifted students need to be challenged in the classroom and realize how critical it is to

both the prevention and reversal of underachievement among gifted students (Winebrenner, 2001). Both Heacox (2009) and Rubenstein (2011) agreed with Winebrenner (2001) noting that students identified as gifted are unique learners who vary from other students. For gifted students to be successful, they need to learn the relationship between their efforts and results. They must have the desire to continuously learn beyond what is taught in the classroom. Rubenstein (2011) added that the classroom teacher and school environment must provide gifted students with the appropriate learning experiences in order for them to realize their potential and their contributions to self and society.

Background of the Study

The No Child Left Behind Act (2001) changed the delivery of instruction and student arrangements to meet the needs of lower achieving students and to increase their scores on high stakes tests (Mendoza, 2006). A concurrent reduction in funding for gifted programming placed large numbers of gifted students in the general education classroom where they received all their academic instruction (Bangel, Moon, & Capolbianco, 2009). Additionally, this placement of gifted students in heterogeneous (non-specific to gifted learners) classroom meant that teachers are responsible for providing appropriate programming for all students at many different levels of learning.

Mendoza (2006) surveyed ten teachers from four school districts in Colorado who taught in a variety of settings to determine the effects of the

implementation of No Child Left Behind on the education of gifted students. The population of the four districts these teachers represented was 65,846 students, of which 4,401 of the students were identified as gifted. Mendoza found that more time was given for test preparation to students who hadn't met proficiency or academic achievement in the area of reading. This took time from gifted learners. Another finding from this survey was the lack of professional development provided to train teachers on how to differentiate instruction for gifted learners. Although the sample size was small, 10 teachers, the survey gave a voice from a teacher's perspective.

Similar to Mendoza, Bender (2006) reported on a study by the National Research Center on the Gifted and Talented (NRCGT) that gifted students received the same type of instruction and curriculum and at the same pace as their classmates in elementary classrooms across the United States more than 80% of the time. A 2008 survey by the National Association for Gifted Children (NAGC) (Kronholz, 2011) found that little differentiation was present for gifted learners. The survey noted that classroom teachers lacked the background and the experience to meet the needs of gifted learners.

An earlier study (Caraisco, 2007) with elementary students in New York compared the potential academic and attitudinal gains of gifted and talented learners using a different instructional method with Contract Activity Packages (CAP) versus the traditional science lesson from the Scott Foresman Science curriculum. The population included 25 fourth grade students in a

gifted and talented self-contained classroom. Students were identified as gifted based on the Otis Lenin Ability Test (OLSAT). The OLSAT is a test of abstract thinking and reasoning ability of children pre-K to 18. It is a group-administered multiple choice test that measures verbal, quantitative, and spatial reasoning ability. These students were also given the Our Wonderful Learning Styles (OWLS) Inventory, a learning styles inventory developed by Professor Rita Dunn in 1998, to assess students' learning preferences or styles. Pre- and posttests were given for each unit. The findings showed that students were highly engaged during the CAP unit of study compared with the traditional lessons. Caraisco (2007) conducted an analysis of variances (ANOVA) along with correlation tests for each instructional situation and found significant improvement in gains (a= .05) and final test scores (a= .01) when students used the CAP method. The classroom teacher found students to be more involved and excited when they had a choice of learning material through CAPs rather than the traditional method. Rogers (2007) synthesized the results of 40 studies and found that gifted students that were provided with a challenging curriculum with like-ability peers had significantly higher test results and improved self-esteem.

A study (Westberg, Archambault, Dobyns, & Salvin, 1993) based on structured observations with 46 third- and fourth- grade classrooms using the Classroom Practices Record (CPR), documented the extent to which students identified as gifted received differentiated instruction. The CPR indicated that

a limited amount of differentiation was given to gifted learners. Fourteen types of instructional activities were coded in the five subject areas: reading, math, language, science, and social studies. Across all five subject areas, students identified as gifted experienced no differentiation in 84% of the activities they experienced. As a result of this study's findings, the National Research Center on the Gifted and Talented, recommended that teacher preparation programs should provide an awareness of and an opportunity for practicing techniques for meeting the needs of high-ability students in the general education classroom. Mendoza (2006) noted that experience and education with gifted students should be a priority at the pre-service level. Two years later, as a result of passage of the Higher Education Opportunity Act in 2008, all teacher preparation programs were required to include information pertaining to teaching gifted learners (Bianco, 2010). Bianco further suggested that professional development for all teachers on differentiation for gifted learners is an important component of heterogeneous and homogeneous classrooms.

Adelson, McCoach, and Gavin (2012) agreed with the findings from the National Research Center on the Gifted and Talented (Westberg et al., 1993) that there was a need for additional research on the effects of gifted programming. That same year, Adelson et al. (2012) noted that it is necessary to compare gifted students receiving programming to gifted students not receiving programming using standardized, objective measures. Several

additional research studies (Bartlett, Hunsaker, & Nielsen, 2010; Flint &

Ritchotte, 2012; Rogers, 2007) explored other aspects of gifted education.

Hunsaker et al. (2010) noted that research on gifted education could be

extended through the implementation of quasi-experimental studies, but with a

broader variety of teaching practices while Flint and Ritchotte (2012) asserted

that the ongoing criticism of research in gifted education was the lack of

cohesiveness.

The importance of intentionally providing for individual differences is

not new, Fiedler, Lange, and Winebrenner (1992) suggested that, in their

efforts to provide equity for all students, educators have forgotten Thomas

Jefferson's statement: "Nothing is so unequal as the equal treatment of

unequal people" (p. 4). Fiedler et al. (1992) added that providing all students

with an equal opportunity to actualize their potential, to learn at their highest

level, creates an optimal learning experience for all.

Statement of the Problem

"Being gifted in America today is not necessarily a positive

experience" (Winebrenner, 2001, p. 9). The author believed that people in

education spend a considerable amount of time teaching students and the

public to appreciate diversity, but have not considered giftedness as needing

differentiation. In that same vein, Smutny (2003) noted that educating gifted

students in the regular classroom involves challenges and may cause teachers

to feel overwhelmed in their attempts to meet the needs of the gifted learner.

A suggestion, according to Smutny (2002), was that of improvements in learning alternatives or differentiation for gifted learners such as: (a) learning centers; (b) multilevel class groups; (c) mentors inside and outside of class; (d) a richness of resources; and (e) internships.

Combined, the research indicates that educators must address critical issues when designing programs for the gifted and talented. One of these issues is, of course, the cost of financing gifted learner programs. In efforts to equalize public education and as a result of monetary deficits, gifted students have been placed in heterogeneous classrooms so that every child receives the same opportunities from educational funding, resources, materials, and qualified teachers (Mendoza, 2006). This philosophy puts stress on teachers to differentiate in every area of instruction continuously throughout the day. Gentry (1999) stated that deliberate placement of a range of achievement groups in teachers' classrooms, including the placement of a group of students identified as gifted together in one room or what is called cluster grouping, is beneficial to both students and the teacher. Bender (2006) concurred that teachers should provide instruction for those students with exceptional abilities and talents that is differentiated from the instruction for other students in the general education classroom.

McGlonn-Nelson (2005) identified that one of the things missing from the field of gifted education was the means of assessing gifted students for learning potential. Earlier, Passow and Frasier (1996) noted that the

assessment tool used to assess learning potential should be authentic and include multiple criteria along with non-traditional measures. These measures could include providing students the opportunity to demonstrate their exceptional abilities outside of school, work samples, or other products other than an assessment. The following year Johnsen (1997) conducted research on the assessment tools used to identify students that are gifted and talented. Johnsen (1997) found that few of these measures examined gifted and talented students' strengths. The author believed that, while many measures addressed problem solving abilities, the measures did not consider how the problem was solved or how the student manipulated it to determine the answer. Additionally, as Johnsen (1997) noted, the assessments are typically independently administered inside a classroom setting without any feedback from peers or teacher assistance. The assessments used, within the classroom and/or independently, included the Cognitive Abilities Test, Gifted and Talented Evaluation, the Iowa Tests of Basic Skills, Scales for Rating the Behavioral Characteristics of Superior Students, and the Stanford-Binet Intelligence Scales. However, according to Johnsen (1997) and Kanevsky (1995), none of these instruments can fully determine a student's learning potential. Furthermore, the NAGC (2008) noted that the assessment material used for identifying students for receiving gifted services should be appropriate for the characteristics of the students being assessed. Similarly, Davis and Rimm (2004) suggested: "In the real world of schools,

identification of giftedness is surrounded by political and personal problems that go beyond reliability and validity" (p. 86).

How does public education meet the needs of gifted learners by providing a challenging environment? Is it better to have homogeneous or heterogeneous classrooms? Providing teachers with professional development on differentiation and the use of critical thinking while engaging students' interests is the beginning of providing a challenging environment for gifted learners. This includes providing an environment of choice to students. At the same time, using purposeful and authentic assessments in the identification process of gifted learners is beneficial.

Purpose of the Study

Taking earlier research into account, the purpose of this study was to describe and analyze the effect of academic achievement in reading of gifted students in homogeneous and heterogeneous groupings using quantitative research methods in an elementary setting over a four-year period.

Rationale for the Study

A national travesty is occurring within the gifted student population in the United States. According to Coleman and Cross (2005), the educational community and school leaders are responsible for the inconsistencies and lack of research on methods of meeting the needs of gifted learners. Gifted students have been placed in heterogeneous groups so that all students have the same or equal access to educational funding. However, Smutny, Walker,

and Meckstroth (2007) pointed out that there are consequences to gifted learners if their needs are not met. These consequences include: (a) early underachievement; (b) loss of interest and joy; (c) low self-esteem; (d) social isolation; (e) behavior problems; (f) poor coping skills; and (g) avoidance of opportunity. The authors noted that it is vital that public education address the controversial issue of how to meet the needs of gifted learners, specifically determining the best model of instruction: differentiation, cluster grouping, within class grouping, grade advancement/grade skipping, heterogeneous grouping, homogeneous grouping, pull-out, and/or subject acceleration.

With Smutny's et al. (2007) research in mind, the focus of this study was to determine the relative effectiveness of homogeneous grouping of gifted students in reading. This study looked at the long-range growth in the area of reading using one group of students placed in a homogeneous gifted classroom for one year in fifth- grade. The researcher compared those same students with peers who were identified as gifted through eighth grade using the Measure of Academic Progress (MAP) reading growth scores spring 2010 to spring 2014.

Research Question

One research question formed the foundation of the research:

1. What are the differences in academic achievement in reading over a four- year period between students who are educated in heterogeneous and homogeneous gifted education program delivery models?

Hypotheses. Two hypotheses addressed the research question:

H1o: There is no difference in student academic achievement in reading over time between heterogeneous and homogeneous groupings of gifted students.

H11: There is a difference in student academic achievement in reading over time between heterogeneous and homogeneous groupings of gifted students.

Significance of the Study

National leaders in the field of gifted education are concerned about the effect of No Child Left Behind (2001) on gifted and talented students (Mendoza, 2006). Educators have experimented with gifted program models and structures for many decades. The central focus of this study is on the relative effectiveness of homogeneous groupings of gifted students in elementary school settings. Delourt, Cornell, and Goldberg (2007) concluded that research on the effects of gifted student programming is far from conclusive. "It has been theorized by many gifted education researchers that

the specialized educational setting (e.g., a separate school or classroom) benefits academically advanced students effectively" (Eddles-Hirsch et al., 2010, p.106). Adelson, McCoach, and Gavin (2012) believed that there was a need for more rigorous research involving the programming and curriculum that would increase academic achievement for gifted students using different models of instruction. The purpose of this study was to aid educators by providing relevant information on how to best service the gifted population.

According to Hoover, Sayler, and Feldhusen (1993) and Delcourt et al. (2007), there have been few empirical studies on the prevalence of homogeneous grouping of gifted learners. Similarly, Karen Rogers (2002) asserted the need for more research on the best model for gifted learners and cautioned that teachers must differentiate instruction appropriately to meet the needs of gifted learners. Rogers' (2002) research concluded that little has been documented regarding full-time gifted programs (homogenous grouping) to attribute academic gains based on the grouping or the differentiation of the curriculum.

As a result of this lack of current research involving gifted learners, there is inconsistency in how the gifted learner programs and practices are being used across the country. Winebrenner (2001) stated that teaching students as one unit together (heterogeneous classroom) holds gifted students back from the pace they need to further their learning. As a result of the current reality in education and the fact that schools are judged on test scores

based on standardized assessments, school leaders, teachers, and students could benefit from data on homogenous versus heterogeneous grouping of gifted students.

A meta-analysis by Tarver and Culross (2007) listed the following common themes in gifted and talented education:

- an increased need for knowledge about gifted students;

- the need for better identification and programming of gifted students;

- methods for using various disciplines to educate gifted students.

Caraisco (2007) also noted several problematic areas in gifted and talented programs that must be addressed. These include using a reliable measuring instrument, differentiating instruction on the basis of learning preferences, and supporting learning in different models.

Again noting the consequences of not addressing the educational needs of gifted students, Mendoza (2006) said: "Face it—these gifted students are our future leaders, and if we don't start giving them at least equal time and meet their needs, we will be in a sad state" (p. 4). Similarly, Grey (2004) asserted that our nation's most under served and underfunded human resource is approximately three million gifted and talented students. Finally, Smutny (2002) used the analogy of how gifted students are like diamonds and would bring sparkle to the new century if educators recognized their true value and created a process for bringing out their beauty and ability. Later research by

Smutny and Von Fremd (2009) summarized the problem by noting that the

placement of gifted students in heterogeneous classrooms throughout a grade

level is misleading and creates an environment where the gifted learners don't

acknowledge to the teacher that they are missing out or bored.

Definition of Terms

The following definitions explain some of the terms and concepts used

in this study.

Cluster grouping. Placing 5-8 gifted learners at a grade level in one

classroom with the remainder of students having mixed abilities (Rogers,

1993).

Enrichment. Richer and greater depth of curriculum (Davis & Rimm,

2004).

Giftedness. Students who give evidence of high achievement

capability in areas such as intellectual, creative, artistic, or leadership

capacity, and who need differentiated services and activities in order to fully

develop those capabilities (Sisk & Novello, 2009).

Grade advancement/skipping. Accelerating a grade or two based on a

student's academics and criteria set by the district (Smutny, 2003).

Heterogeneous grouping. The absence of grouping students identified

as needing gifted services in one classroom, and placing students with mixed-

ability levels in a classroom (Kulik, 1992).

Homogeneous grouping. Full-time grouping of students in one classroom that have been identified as needing gifted services using the criteria determined by the school district. The grouping of students consists of at least fifteen students (Davis & Rimm, 2004). This grouping is larger than a cluster group.

Pull-out programs. Students being pulled out of their regular classes once or twice a week to participate in special enrichment activities (Davis & Rimm, 2004).

Subject acceleration. Students moving faster through academic content and possibly taking classes or certain subjects with students in higher grades (Davis & Rimm, 2004).

Within class grouping. Different arrangements teachers use within the class to differentiate (Gentry & MacDougall, 2007).

Assumptions and Limitations

Assumptions. Assumptions played a key role in the model evaluation. A key assumption during this research pertained to the role of the researcher as an administrator in the district. There is a possibility of bias whenever data are collected by the researcher. Merriam (2009) stated that acknowledging the assumption regarding the researcher from the beginning alleviates his or her effect on the study. Another assumption is that all teachers in the district taught with the same expectations.

Limitations. The major limitation of the study was the small sample

size estimated at 78 students identified as gifted. One school district with four

elementary schools was selected for the study. This may have affected the

generalizability of the study to larger districts (Roberts, 2010). Various school

differences and teacher differences exist among the classrooms. Another

limitation may be the use of convenience sampling. There is a possibility of

bias whenever data are obtained from this type of sampling.

Nature of the Study

This study explored two different delivery models of gifted education.

Within the heterogeneous and homogeneous classroom settings, some form of

the other models may exist within the classroom. Students identified as gifted

learners in this Midwest school district receive services through four different

instructional levels. Also, included in this study is research on the pedagogical

knowledge general education teachers must have to meet the needs of students

identified as gifted. Data was not collected on the pedagogical knowledge, but

the researcher provided this information as one of the elements that helps meet

the needs of gifted learners. This study has longitudinal data with no attempt

to measure the impact of any one teacher. The implications of this research

include use for decision-making on the appropriate models of instruction and

instructional modifications that will be provided regarding the education of

gifted students in a suburban school district in the Midwest. This study

explored which of the two delivery models, homogeneous or heterogeneous,

was most successful for academic achievement in reading. The homogeneous group consisted of twenty-seven fifth graders identified as gifted. Both the heterogeneous mixed classrooms and homogeneous classrooms had a wide variety of students with a multitude of academic/social needs in the classroom.

Organization of the Remainder of the Study

Is public education meeting the needs of gifted learners? Teachers and the school environment must create a structure for gifted learners to excel academically and in society. Areas that need to be addressed in order to benefit gifted learners include identification, differentiating instruction, and supporting different models of learning environments.

This study is organized into five chapters. The first chapter introduces the concerns about gifted programming and the lack of research available to educators regarding the best model to use in providing for the needs of gifted learners. This section also defines terms that are important to the reader. Chapter two of this study outlines the review of the literature including the historical background. This section also describes the different program delivery models, identification and achievement assessments, and the benefit of providing professional development to teachers. The third chapter focuses on the methodology of the study, which includes the sample size and setting. This section articulates the necessary steps used to help answer the research question. Chapter four discusses the final results of the study and chapter five

was an examination of the findings, implications, and recommendations of

this research study.

Chapter II: Literature Review

"Just challenge those high-ability learners and they'll be all right!" seems to be a common belief among educators of the gifted (Eddles-Hirsch et al., 2010, p. 106). Researchers have suggested that many gifted learners do not have their learning needs met in the typical classroom and rarely experience academic challenge and satisfaction in school (Archambault et al., 1993; Gross, 2004). The field of education does not have a consensus on how to meet the needs of gifted learners. Some options for meeting the needs of gifted learners include differentiation, cluster grouping, within class grouping, grade advancement/grade skipping, heterogeneous grouping, homogeneous grouping, pull-out program, and/or subject acceleration. Some of these options exist within the homogeneous and heterogeneous models. How do educators ensure that gifted learners are provided with the appropriate model to support continuous growth? According to Davis and Rimm (2004), "Tens of thousands of gifted and talented children and adolescents are sitting in their classrooms—their abilities unrecognized, their needs unmet" (p. 1). This study included both past and current sources of research. The relevance in using dated research was to demonstrate that, although there is currently more research on gifted education, it does not necessarily pertain to providing educators with data on the best model to use, nor how they can meet the needs of gifted learners. It does show, however, that the question of what is the best

model to use in educating gifted learners has been an evolving topic for over twenty years and continues to be addressed.

In 1993, *National Excellence: A Case for Developing America's Talent*, was released by the U.S. Department of Education. The document concluded that most gifted and talented students were not given any special or differentiated instruction. As a result, the U.S. Department of Education developed recommendations for America's top students to improve their educational opportunities. The recommendations reported by Jolly and Kettler (2008) consisted of:

- setting challenging curriculum standards;

- providing more challenging opportunities to learn;

- increasing access to early childhood education;

- increasing learning opportunities for disadvantaged and minority children with outstanding talents;

- broadening the definition of giftedness;

- emphasizing teacher development;

- matching world performance (p. 431).

Jolly and Kettler (2008) examined the research priorities for gifted education during the 10 years following the National Excellence Report (1993) using articles from the *Gifted Child Quarterly*, *Journal for the Education of the Gifted*, and *Roeper Review*. Identification was the fifth in the frequency count of the 397 articles. The findings concluded that the most

prominent topics of study from 1994-2003 were special populations such as issues of gender and ethnicity. Teaching and instruction was the fourth most prominent topic in the key word frequency count, and curriculum was 8th out of 10 categories. There were few reports on how achievement can or should be measured in gifted education (Jolly & Kettler, 2008).

Research on how achievement can or should be measured for gifted students across subjects and grade levels is limited. In order to effectively assess as well as provide and improve the practices in gifted education the research must shift from describing it to identifying and verifying best practices for gifted education (Mendoza, 2006). The common thread in past and current research was the desire for more information regarding the best model to use in educating gifted learners. The researcher found limited current literature on homogeneous models of instruction for gifted learners.

Historical Background

In 1920, Lewis Terman and Leta Hollingworth, pioneers in the field of gifted education, began their research on gifted education. More specifically, Lewis Terman introduced intelligent quotient scoring for the Stanford-Binet test that he adapted from Alfred Binet's Binet-Simon intelligence test. After World War I, Terman studied over 600 students with an IQ score of 140 or above. Through his work he provided evidence that highly intelligent children could be mentally and physically healthy and that they would have the ability to be intelligent throughout their entire life. Leta Hollingworth was the first to

dispel the belief that highly intelligent students could take care of themselves. Through her studies Hollingworth showed the importance of early identification, home environment, and school structure by grouping students with similar abilities.

With the launch of Sputnik in 1957, the United States felt the intellectual threat which started the federal government's first large-scale look at resources through The National Defense Education Act (NDEA) of 1958 (Jolly & Kettler, 2008). This act provided $1 billion to enhance science, math, and technology in public education.

Then, in 1969, the United States Department of Education initiated a study on how effective schools were at meeting the needs of gifted students. Based on the study, the Marland Report was completed in 1972 and was the first national report on gifted education. The Marland Report demonstrated the serious inadequacies in educating America's gifted students. Using the report as a foundation, some of the recommendations included the need for special programs for students identified as gifted, making professional support and teacher training a requirement, and making adjustments in the definition of giftedness.

A Nation at Risk, published in 1983, caused a swing in the pendulum by challenging many practices in education and holding American education accountable at an international level. "Although the ball was still rolling, in the mid-1980s the gifted movement began an uncertain step backward" (Davis

& Rimm, 2004, p. xv). The step backward was a commitment to equity by helping below average students become average (Davis & Rimm, 2004). The National Assessment of Educational Progress (NAEP) study (1986) of first and fifth graders showed that only 15 American students were in the top 100 scorers in mathematics and only one was in the top group in fifth-grade compared to students in Taiwan and Japan.

A study from 1987 found that American 13-year-olds performed poorly when tested for higher levels of conceptual thinking. Key points from the report emphasized the need for community involvement at the state and local level, expansion of education programs, the need for providing rigorous curriculum with high level learning opportunities, appropriate teacher training, and sufficient financial support. In 1988, Congress passed the *Javits Act* which provided research monies for gifted education.

In 1993, *The National Excellence: A Case for Developing America's Talent* report was issued by the Department of Education. One of the indicators used in this report was the National Assessment of Educational Progress (NAEP). Based on the results from the NAEP (1990), curriculum offered throughout the nation was inadequate in preparing students to reach high intellectual levels. Schools in the future needed to provide a flexible learning environment with rigorous curriculum and high expectations that was constantly evolving to expand the knowledge of those students identified as gifted. The report noted that educators must continue to improve curriculum

and teaching strategies, make learning meaningful, and set high expectations for students identified as gifted.

The National Association for Gifted Children (2009), defined gifted students as those who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, and who need differentiated services and activities in order to fully develop those capabilities (Sisk & Novello, 2009). Gifted students have a greater predisposition to understand complex interconnections of ideas, enjoy theory, and learn by exploring content in depth (Thomson, 2010). Thomson also concluded that gifted students tend to prefer abstract themes and concepts, logical analysis, and objectivity.

Gifted Program Delivery Models

"Society has a need for excellence. Gifted children have the potential for excellence, and it is our challenge to provide the educational program and environment that will foster their optimum growth" (Smutny, 2003, p. 46). There are many models used when trying to meet the needs of gifted learners. As stated by Johnsen, Haensly, Ryser, and Ford (2002), researchers have proposed alternate ways the classroom environment can be adapted to meet the needs of gifted learners. Practices that address learner differences include: cluster grouping, grade skipping/advancement, heterogeneous grouping, homogeneous grouping, pull-out programs, subject acceleration, and within-class grouping. Smutny (2002) agreed that programming for students

identified as gifted must be qualitatively different from the general classroom

curriculum in order to provide adequate challenge for gifted students which

would result in more creative thinking processes. Important questions posed

by Adelson, McCoach, and Gavin (2012) asked: How does gifted

programming affect all students and the overall achievement of the school?

Which of the models will provide an environment where gifted learners

strengthen their skills in problem solving and creative thinking as well as

cultivate their abilities to make a difference in society? Based on this study by

Adelson et al (2012), the Early Childhood Longitudinal Study, Kindergarten

Class of 1988-1989 database, there was no effect —negative or positive—in

math or reading achievement between gifted learners and non-gifted learners.

This study looked at overall school achievement based on students receiving

gifted services, not on specific programming or services. The reality of this

study provided evidence that more research was necessary to determine the

best model to use to meet the needs of gifted learners and to answer the

question: Do certain models provide students with an increase in reading

achievement?

Differentiation has evolved throughout history from programs such as

the Enrichment Triad Model to models like the Schoolwide Enrichment

Model or Progressive Program Model (Heacox and Cash, 2014).

Differentiation entails the teacher utilizing different tools or resources to

individualize instruction based on student academic and social abilities and

talents. According to the Council of State Directors of Programs for the Gifted and National Association for Gifted Children (2011), the regular classroom is the most used delivery system for servicing students identified as gifted in pre-kindergarten and kindergarten and the second most used delivery system for second grade through middle school. The first most used delivery system was the resource room. A study of 6,280 fourth through sixth graders showed that most students who are of high ability in elementary school were spending the majority of their time in the regular classroom (Assouline, Colangelo, Heo, & Dockery, 2013).

A similar study by Archambault et al. (1993) used the Classroom Practice Survey with nearly 4,000 third and fourth grade teachers. The teachers rated the frequency with which they differentiated instruction to meet the needs of gifted students. Results indicated that regular classroom teachers only made slight modifications in their instructional or curricular practices. Johnson et al. (2002) noted that meeting the needs of gifted and talented learners is a crucial concern for educators: "With the growing emphasis on inclusion and the pressure to disband special programs for gifted students, it is imperative that general education teachers be trained to offer differentiated instruction" (p. 45).

Tomlinson (1995) reported that, as far back as Bishop (1968), research has shown that teachers who were motivating and inspiring with student-centered teaching styles were most effective with gifted students. When

teachers differentiate curriculum, they are not dispensers of knowledge, but organizers of learning opportunities (Tomlinson, 1995). Differentiation provides variations among learners using multiple approaches that enrich and modify instruction and curricula to match individual needs of students (Renzulli, 1977, 1988; Tomlinson, 2000).

Smutny (2011) concluded that, in a classroom with a wide range of ability levels, it takes more time for a teacher to differentiate and individualize instruction. Similarly, Tomlinson (2001) contended that differentiation is not just a strategy, but a philosophy, one that is based on the belief that teachers need to identify each student's starting place for learning. Part of that process, according to Tomlinson (2001) is the importance of pre-assessing students and providing an environment of differentiation. Smutny, Walker, and Meckstroth (2007) used this analogy to explain their philosophy:

> If the curriculum is a journey, then the learners will include a wide range of 'travelers.' Some are brimming with energy and want to zoom straight to the destination; they've spent their lives sprinting and love the exhilaration of the view, the freedom of moving at their own speed, and the spring in their feet as they run. Others are dreamers. They prefer little side streets and stops along the way and ask for time to contemplate the road from a hill or tussock, breathe in the country air, and note the unique markings of a migrating flock of birds. A number of travelers need support on their journey. Some forget their walking

shoes and ask whether their jacket will keep them warm. Some need
periodic stops for snacks and special maps that help them see where
they are and how they should proceed to their goal. Some show
amazing strengths in their journey but still need help in other areas.
Several have a navigational ability that outstrips their peers, but they
miscalculate the time it will take them to accomplish each phase of the
trip. A few can't read a map to save their lives but can use their
compasses expertly, talk to people along the way, and make notes
about landmarks. (p. 28)

Differentiation for advanced learners requires teachers to be familiar
with above-grade-level standards, in-depth content, advanced and extended
resources, and alternative instructional strategies (Rakow, 2012). Van Tassel-
Baska and Little (2011) defined differentiation like this:

A differentiated curriculum for the gifted is one that is tailored to the
needs of groups and/or individual learners, that provides experiences
sufficiently differentiated from the norm to justify specialized
intervention, and that is delivered by a trained educator of the gifted
using appropriate instructional and assessment practices to optimize
learning. (p. 10)

Van Tassel-Baska and Brown (2007) noted that best practice in
curriculum and instruction consists of the use of advanced curricula in core
areas of learning by grouping gifted students within the class based on their

interests and using inquiry. Providing learning opportunities that are connected to real life and world application is beneficial for gifted learners.

Kanevsky (2011) assessed gifted students compared to non-gifted students in terms of their preference of learning in their favorite school subjects using the Possibilities for Learning survey. There were 646 participants in Grades 3 through 8 with 416 identified as gifted learners and the others not identified as gifted. The study used 110 questions on a five-point Likert-type scale response format (strongly agree to strongly disagree). The findings showed that most students in both groups:

- preferred some form of curriculum differentiation;

- expressed a desire to have a voice in what and how they learn;

- had a desire to control the pace of their learning;

- had a desire to have a choice in their workmates.

The top three items receiving positive ratings for students identified as gifted (SIG) and students not identified as gifted (SNIG) were: I really like …learning at my own speed, doing projects with a partner when I get to choose my partner, and learning about topics I choose.

The findings showed that students identified as gifted (SIG) were more focused on the quality of the content versus those not identified as gifted (SNIG). The results demonstrated that 75.2% of students identified as gifted (SIG) compared to 55.4% of students not identified as gifted (SNIG) preferred complex content and problems as the highest difference (a 19.8% difference).

Seventy-two percent of students identified as gifted (SIG) stated that creative solutions to challenging problems and pursuing their own interests was important compared to 61.1 % of students not identified as gifted (SNIG) (an 11.5% difference). Understanding the interconnections between ideas, authentic problems, expert knowledge, and determining the format of their product were other areas identified as important for gifted students using the Possibilities for Learning survey (Kanevsky, 2011).

Areas that students identified as gifted (SIG) disliked included asking for help (49.6%); students not identified as gifted (SNIG) were at 32.5%. Students identified as gifted (SIG) disliked waiting for classmates to finish or catch up with work (53.4%) of the time where students not identified as gifted (SNIG) disliked it 39.7% of the time. Based on the research, Kanevsky (2011) concluded that the gifted students sought rich, authentic, rigorous content at a challenging pace related to their interests more than non-gifted students.

Gifted learners need more time to explore content in depth and prefer greater complexity so they can expand their learning and become independent thinkers. Researchers determined teachers need to provoke dialogue, discussion, debate, and discovery knowing that the need for preparation with flexibility is the key (Barbour & Shalilee,1998; Smutny, Walker, & Mechstroth, 2007).

Tomlinson (1996) noted that it is essential for students identified as gifted to have qualitatively different curriculum than other students in order to

enhance their thinking processes and keep them engaged in learning.

Tomlinson proposed the following guidelines to meet the needs of gifted

learners: (a) active learning environments (students as doers); (b) continual

assessment processes; (c) flexible grouping patterns; (d) clearly articulated

expectations, and (g) guidance for success.

Smutny et al. (1997) suggested an approach for designing a learning

environment that creates a classroom where differentiation is established:

- invites children to be creative by displaying colorful posters and
  pictures and materials and resources;

- uses thematic instruction in order for children to make connections
  in their learning;

- provides a wide range of materials and resources to extend learning
  to deeper levels;

- fosters self-initiated and hands-on experimentation;

- provides a seating arrangement that students can sit together when
  working on projects;

- provides children options for more challenging work that will
  extend their learning;

- provides on-going assessment.

Historically, the teacher was someone who told and imparted all of the

knowledge. Current research has established that the teacher (the activator)

should be the one to activate learning by questioning, challenging students to

explain why they think that way, and affirm that to be successful one needs to work hard at gaining knowledge (Fullan, 2014). Gifted students should be encouraged to solve problems and learn how to frame questions and discover their answers.

Every district can integrate approaches and models that include various kinds of gifted services that reach a variety of learning needs. Based on an on-going assessment of the student population, schools can combine acceleration, enrichment, and differentiated instruction to develop students' abilities in effective and appropriate ways (Smutny, 2003, p. 69).

Firmender, Reis, and Sweeny (2013) examined the need for teachers to differentiate instruction and reading content in order to enable students to excel and make continuous progress in reading. The researchers stated that minimal research has been conducted that pertains to student reading comprehension and fluency in either heterogeneous or homogeneous grouped classrooms. The study consisted of 1,149 third through fifth-grade students in five diverse elementary schools. The results showed the importance of differentiation in classrooms by demonstrating a wide range of reading comprehension grade level equivalency scores and reading fluency. Students in third grade had scores of approximately 37% with a range of five or more grade levels. In fourth grade it was 67% and in fifth-grade it was 65% with a five grade-level range (Firmender, Reis & Sweeny, 2013).

The Enrichment Triad Model was the original model developed by Joseph Renzulli in 1977 to benefit students in special programs for gifted and talented. It has evolved to be the Schoolwide Enrichment Model (SEM). The original Enrichment Triad Model was designed to promote creativity by giving students the opportunity to study various topics and areas of interest. It was based on these three types of enrichment similar to the Schoolwide Enrichment Model: (a) general exploratory activities; (b) group training activities; and (c) individual and small group investigations of real problems in which students had the option to achieve at high levels, applying advanced content to self-selected areas of interest (Renzulli, 2002).

The Schoolwide Enrichment Model (1997) was the revised version of the Enrichment Triad Model. The concept of both of these models was to create a repertoire of services that can be integrated into the general education classroom to benefit students at all levels. The first model focused more on special populations, like students identified as gifted, but the updated model focused on a school culture that creates a learning environment where all students have the opportunity to create a meaningful, high-level approach using hands-on investigations for the application of knowledge to complex problems. According to Renzulli (2002), the goal was to provide all students with the opportunities, resources, and support to achieve their maximum potential. This model also consists of three types of enrichment experiences at a more specified level (Reis & Renzulli, 1997):

- Type I enrichment provides students with an array of disciplines, topics, and hobbies using speakers or demonstration type activities to entice students.

- Type II enrichment consists of group training activities like creative thinking and problem solving or how-to-learn skills.

- Type III enrichment is designed for students to pursue a self-selected area where they will complete the project independently.

It is important to get the historical view of how the models have evolved over the years so they can be utilized at all academic levels. The Schoolwide Enrichment Triad Model has been evaluated in 29 school districts and researchers found that it has created positive changes in teacher attitudes toward student work. More recently, this model has been used in the enhancement of reading fluency for students in third through sixth grade. VanTassel-Baska and Brown (2007) reported on a study conducted by Reis et al. (2003) that showed these students had a significant increase on the Iowa Test of Basic Skills reading comprehension test.

Instruction that differentiates learning based on the needs of the students is intended to provide a better instructional match for each student at his or her level of academics. These assignments are purposeful, relevant, and add depth and breadth to students' understanding of standards (Heacox, 2002). In tiered instruction, gifted students have the opportunity to work within the

same unit, but at the appropriate level and pace for their learning or academic needs.

The Progressive Program Model (PPM) created by Heacox and Cash (2014) is another way to differentiate instruction for students identified as gifted. This model defines the intensity at each level of service and is similar to the original Triad Model and Schoolwide Model in that it has a repertoire of services utilizing the tiered programming. The three tiers consist of simple infused programming to individualized specific programming (2014). Among the tiers of instruction are three dimensions that include cognitive, personal/emotional, and social. The cognitive dimension provides services that increases the pace, depth, and complexity of instruction and content, which helps to develop independent learning skills. The personal/emotional and social dimensions include differentiation that includes personal identity development as well as social competence. The three main objectives with the PPM are: (a) support and accelerate gifted learners; (b) identify those students underrepresented in gifted programs; (c) develop the gifts and talents of all learners.

Tomlinson and Imbeau (2010) described differentiation as a balance of knowing each individual student and the curriculum. In order for students to be successful, educators use four areas of differentiation: content, process, product, and affect. Content is the knowledge, understanding, and skills students are expected to learn.   Process is how students retain, apply, and

transfer the knowledge acquired. Product is how students demonstrate and apply what they have learned over a period of time. Affect is how a student feels, emotionally, about his or her learning. If students have a positive affect regarding learning they will be motivated to learn, but if they have a negative affect they will not be willing participants in learning. The model of differentiated instruction requires educators to be flexible in their approach to teaching. This includes modifying how and what they teach in a variety of ways, all of which allow students to maximize their growth and individual success.

Cluster Grouping

A practical model utilized to meet the needs of gifted learners is cluster grouping. It effectively provides an inclusive environment that improves student achievement (Brulles & Winebrenner, 2012). Cluster grouping consists of five to 10 gifted learners placed in a classroom at a grade level with the remainder of the 15-20 students having mixed abilities (Davis & Rimm, 2004). Cluster grouping of gifted learners reduces the range of achievement levels that the teacher has to differentiate in the classroom (Coleman, 1995; Delcourt & Evans, 1994; Rogers, 1993). Cluster grouping provides the means for gifted learners to receive a differentiated curriculum with like peers.

Advocates of gifted education (Delcourt, Cornell, & Goldberg, 2007; Rogers, 2007) agreed that in order to increase learning and achievement for

gifted students, they must be allowed to interact and learn with like-ability peers. The research has consistently demonstrated significant relationships between the number of gifted students in a classroom and the increase in differentiation for gifted students (Archambault et al., 1993). When gifted students are clustered for multiple years, students form bonds and develop together socially (Brulles & Winebrenner, 2011).

Gentry and Owen (1999) examined the use of cluster grouping in a small, rural school district during a four-year period, which included students from Grades 3-5 for a total of 197 students. The students in the treatment school used the Iowa Test of Basic Skills (ITBS) Form G while students in the comparison school used the California Achievement Test (CAT) to measure academic achievement. All staff in the cluster school was involved in professional development with an overview of gifted education and talent development throughout the study. They also participated in two half-day trainings on the Schoolwide Enrichment Model. The professional development consisted of staff being introduced to the Schoolwide Enrichment Model (SEM) and being shown curriculum modifications and differentiation techniques, which would allow them to provide different levels of learning to all students.

Gentry and Owen (1999) found that the school that used the cluster model showed an increase in the number of students identified as high achieving and an increase in the use of differentiation in those classrooms to

meet the needs of individual learners. Professional development continued throughout the study, and staff indicated that it played an important role in the students' development and success. The 17 teachers and administrators believed that cluster grouping benefited students and staff in the treatment school (Gentry & Owen, 1999).

A study conducted by Brulles, Saunders, and Cohn (2010) consisted of 772 students in Grades 2 through 8. These students were in two heterogeneous groups with the gifted cluster group receiving gifted services and the non-clustered group not receiving gifted services. Findings from this study indicated that students in the gifted cluster with trained teachers experienced greater academic growth than those who were not clustered in a heterogeneous class. The students in the gifted cluster demonstrated statistically significant achievement growth. The teachers in the cluster model received strong supported staff development and met as a group monthly. The assessment tool used to determine academic gains was the district math assessment that correlated with the Arizona state standards. Student learning with the gifted cluster was found to be at higher levels than the non-cluster group. The findings of this study support assertions that it is beneficial to cluster students identified as gifted with a highly effective teacher trained in gifted education.

Within Class Grouping

Within class grouping refers to arranging students into smaller groups in a heterogeneous classroom for instruction based upon achievement data (Kulik, 1992). The teacher usually spends a period of time with each group providing their level of instruction, which might include curriculum compacting.

Researchers examined the effects of within-class achievement grouping in reading across a kindergarten year in 2006 and another in 2011. The findings of both studies revealed that the frequency with which kindergarten teachers used achievement groups positively related to increase in reading across the kindergarten year. The study by Adelson and Carpenter (2011) included kindergarteners enrolled in classes where teachers reported the use of within-class or achievement grouping. The data were collected from a national database with a sample size of 9,340 students from 580 schools. The reading assessment used was from Early Childhood Longitudinal Study-Kindergarten Class 1998-1999 and was designed to show a progression of skills and knowledge of basic skills. The assessment scores were calibrated using an average item response theory (IRT), which computes reading growth by subtracting each student's fall score from their spring score (Adelson & Carpenter, 2011).

The findings showed the average effect of within-class grouping on reading growth was 10.91 for kindergarten students the year they were in the

classrooms where within-class grouping was present. This compares to 10.29 growth for students who did not participate in within-class grouping. Students in the achievement group experienced a significant .62 points greater in reading growth from fall to spring using the ECLS-K. This study showed evidence of the academic benefits of reading using within class or achievement grouping with kindergarten students identified as gifted (Adelson & Carpenter, 2011).

Curriculum compacting: A systematic procedure for modifying the curriculum for above average ability students can be utilized within this type of model. Compacting provides students with opportunities to utilize challenging curriculum without grouping the entire class in ability groups (Winebrenner, 2001). Compacting enables above-grade level students to continue to learn at a pace appropriate for them and work in small groups within the classroom. Compacting helps students deal with the part of the curriculum that represents "trash" to them because it is expendable, meaning they have already demonstrated mastery (Winebrenner, 2001). Compacting gives teachers the ability to provide gifted children the time to move at their own pace acquiring new content and advancing their knowledge in an area (Smutny, 2003).

Davis and Rimm (2004) noted that compacting involves students advancing at a faster rate than their peers through the assessment of the teacher of their strengths and needs. Based on the results of the pre-

assessment, teachers can group students within the classroom. Curriculum compacting is pretesting for mastery of the material presented in order to individualize learning and provide an alternative curriculum to provide a challenging learning environment (Davis & Rimm, 2004). This enables the teacher to interact with depth and complexity and focus on development of higher level skills (Kaplan, 1999). Pre-assessing before planning instruction involves evaluating each student to determine areas of mastery then planning alternative experiences for each student based on his or her cognitive and creative gifts. Renzulli and Smith (1978) developed a form for the teacher and student to use called "The Compactor." This form gives both teacher and student the structure to assure that students are being challenged at their level. It can take more time up front to plan alternative experiences for each student, but once goals are established, the strategy becomes routine.

A study including 70 first grade students enrolled in two rural Alabama schools showed that a high percentage of basic skills content could be eliminated for gifted learners (Stamps, 2004). The four classrooms used in the study were chosen at random using above-average scores and cluster sampling in high-ability classrooms. The treatment group consisted of 35 students with three students identified with a learning disability. The control group consisted of 35 students.

One of the instruments used in this study consisted of the Curriculum Compactor form developed by Renzuilli and Smith (1978), which was used to

document the content areas in which students showed strengths (Stamps, 2004). The Classroom Practice Questionnaire was used to gain information on teachers' classroom practices while the Content Area Preference Scale (CAPS) form was given to students to determine and measure subject areas that students preferred (e.g., reading, math, science, and social studies). The Teacher Data Form was utilized to gain information on educational and teaching experience of the four teachers in the study.

The treatment group received two hours of professional development in compacting by the gifted resource teacher. The gifted resource teacher explained that compacting curriculum would be used for students who had already mastered the skills and content. The curriculum compacting project was implemented for approximately 17 weeks. The control group did not receive any professional development.

The findings (Stamps, 2004) showed that the treatment group compacted a mean of 32.5% of curriculum during the study. Curriculum modifications in math and language arts were made more often than in other subject areas. Teachers pre-assessed students to determine mastery on regular curriculum. Treatment teachers' enrichment activities were present in 75% to 100% of the curriculum modifications.

A t-test for independent samples was used to show that there was a significant difference in favor of the treatment group on classroom teachers' practices. The average for the treatment group in adjusting curriculum and

changing teacher practice was a mean score of 108 and 79 for the control group. According to Stamps (2004), the treatment group teachers enjoyed compacting because it made learning fun and children wanted to attend school. One treatment group teacher mentioned that compacting allowed teachers to extend a unit of interest to the students. Compacting curriculum gave teachers the ability to individualize classwork and tailor the curriculum to the needs of individual students. Pre-assessing students and providing curriculum and instruction that students academically need would provide a more challenging curriculum to keep them motivated in the classroom.

Grade Advancement/Grade Skipping

Another model used is grade advancement or grade skipping, which is accelerating a grade or two based on a student's academics and criteria set by the district (Smutny, 2003). For example, a gifted second grader might move to a third grade class. Grade skipping is a cost-effective way of allowing the student to skip a grade or two to help meet their needs in accelerating through the curriculum (Davis & Rimm, 2004). Van Tassel-Baska (1986) identified that academic acceleration benefits gifted students by:

- improving motivation, confidence, and scholarship;

- allowing students to develop better learning habits;

- letting staff complete their professional training earlier;

- reducing the cost of their college education.

It is important to look at the child's social, emotional, and academic needs when using this option.

Heterogeneous Grouping

Some school districts do not have the resources available to have special classes or programs for gifted students (Davis & Rimm, 2004). Heterogeneous grouping is the absence of ability grouping in which all ability levels are placed in a classroom (Kulik,1992). This grouping provides students of all abilities the opportunity to work together and receive the same curriculum. Heterogeneous grouping could include differentiation of curriculum and instruction when the teacher provides for it.

Homogeneous Grouping

For this study homogeneous grouping refers to the full-time grouping of 27 students in one classroom who have been identified as needing gifted services using the criteria determined by the school district. Rogers' (2007) synthesis of research found that some sort of homogeneous grouping of gifted students using differentiated curriculum is beneficial to students both academically and socially. Kulik (1989) found that gifted learners grouped in homogenous classrooms outperformed non-grouped students. Researchers found higher achievement in literature and mathematics when high-end curriculum was used in self-contained settings (Gavin, Casa, Adelson, Carroll, & Sheffield, 2009; VanTassel-Baska, Zuo, Avery, & Little, 2002).

One issue that has been brought to the forefront is whether gifted learners are needed in the heterogeneous classroom to act as role models for other students. According to Allan (1991), this jeopardizes that the students identified as gifted own educational needs may not be met. Another concern of homogeneous grouping is the possibility of negative effects on students' social and emotional development (Vogl & Preckel, 2014). Some students in this type of model feel isolated and suffer under pressure to perform because they are not used to being with peers at their level. It is a humbling experience when gifted students are in a homogeneous class and they realize there are other bright students who are equally capable. This may cause lower self-esteem because of their lack of experience in learning with other students at their academic level. It may be that those students who are transitioning into the homogeneous class are adjusting to a more realistic view of their own academic abilities (Gross, 2004).

Heacox and Cash (2014) shared that like-peer groupings can lead to a sense of elitism by the gifted. Coleman and Fults (1985) suggested that this was a function of social comparison theory in action because it is human nature for people to compare themselves. Hoge and Renzulli (1993) concurred, noting that the act of surrounding one's self with academic equals may have an equalizing effect instead of the often criticized elitist effect associated with ability grouping.

Removing the gifted learners from the general education classroom may allow other students to emerge (Kennedy, 1989; Winebrenner, 1992). Gifted and high-ability learners show positive academic effects from some forms of homogenous grouping using differentiated curriculum with specially trained teachers (Allan, 1991). When gifted learners have the opportunity to work with their intellectual peers, social and emotional difficulties have decreased (Smutny, 2011). Adelson et al. (2012) added that advocates of gifted education believe that gifted learners should be given the opportunity to increase learning and achievement to a level that will allow students to exceed their full potential academically and to experience enhanced self-esteem by interacting with like ability peers. The "gifted" label is not enough, and too many schools provide pull-out or push-in services with a gifted teacher for a few hours a week. However, as with students with learning disabilities, gifted students are gifted all day long——not for just a few hours each week (Rakow, 2012).

Pull-out Program

Pull out groupings are sometimes referred to as enrichment. This model provides gifted students the opportunity to go to another classroom to extend the normally prescribed curriculum for their grade level once or twice a week (Colangelo, Assouline, & Gross, 2004). Students spend most of their time in a heterogeneous classroom and are pulled out to attend classes for gifted students. A pull-out program at the elementary level may consist of

students receiving services from a gifted teacher in a variety of formats. This may be services from as little as an hour to a full day once or more a week. Accommodations for learners identified as gifted usually consist of pull-out programming (Fogarty & Pete, 2011).

Subject Acceleration

Subject acceleration is based on student academic achievement. A student progresses through the required curriculum at a faster pace or masters skills at a faster pace and may be moved to the next grade in a certain subject area. Another way to define acceleration is students moving at a faster pace than their peers and taking classes or certain subjects with students in higher grades. Subject acceleration permits the student to be challenged in a specific academic content or area of strength while continuing to develop at grade level in other areas with his or her peers (Davis & Rimm, 2004).

A study of 60 young Australians that has been going on for 22 years has shown that those 17 students who were accelerated, compared to the other 33 who were not, were more successful academically and socially as adults (Gross, 2006). Single-subject acceleration studies have found that this type of acceleration has produced academic gains of about three fifths of a year's growth for participating students (Bailey, Chaffey, Gross, MacLeod, Merrick, Targett, & Canberra, 2004). The researchers noted that evidence shows that if the acceleration is done properly, looking at each child as an individual, it is beneficial to the child academically, socially, and emotionally.

Identification and Assessment

Identification. There are many challenges in the identification of giftedness. According to Smutny (2003), school districts are required to define giftedness and the tools used for identification of giftedness in order to acknowledge the abilities and behaviors that will be developed and nurtured. Some school districts use a definition that stresses the idea of a cutoff score or a set of scores that determine those who qualify as gifted. Smutny (2003) and VanTassel-Baska (2000) believed that the difficulties for schools in trying to identify gifted children will continue until educators and society agree on a universal term about the nature of being gifted. More progressive districts recognize the different abilities/talents of gifted students at different times throughout development; identification is an ongoing process not just a one-time situation (Smutny, 2003).

Tarver and Culross (2007) were aware that identification practices and educational programs for gifted students needed to be improved. According to Smutny, Walker, and Mechstroth (2007), evaluations should involve some form of assessment and also look at other sources of information regarding a child's interests, learning style, and any other special talents already identified. Davis and Rimm (2004) stated that the increasing use of multiple criteria shows that giftedness is recognized beyond an intelligence quotient number. Finally, an important change that is recognizable is the shift from looking at one instrument to determine if a student is gifted to allowing a more

flexible approach utilizing other assessments to identify gifted students (Rubenstein, 2011).

Some instruments used for confirming suspected high intelligence in students are individual intelligence tests, particularly the Wechsler Intelligence Scales for Children and the Stanford-Binet Intelligence Scale (Davis & Rimm, 2004). These tests may yield a more accurate score, but they still may have a low ceiling for some gifted children (Smutny, 2003). For example, tests such as the Otis-Lennon Mental Abilities Test ask for one right answer and include few items that demand higher-order and divergent thinking. This type of test presents problems for creatively gifted children because they do not think that way (Smutny, 2003). Using standardized testing to identify giftedness in young children will always be an underestimation of their ability and using a multidimensional approach is most beneficial.

Renzulli's (2002) revised instrument to determine whether a student may be considered at the superior range is the Scales for Rating the Behavioral Characteristics of Superior Students. This instrument utilizes 14 different dimensions to determine if a student is at the superior range. The first four scales (learning, creativity, motivation, and leadership) are the ones used most by schools that use *Scales*, but the remaining 10 scales are focused on specific areas like math and science. Schools utilize those scales when looking for certain criteria in programs servicing gifted math or science students.

According to Pfeiffer and Jarosewich (2007), there are few adequate screening instruments used to provide a more comprehensive picture of students' abilities that collaborate with the IQ test. The Gifted Rating Scale Form (GRS) assesses the multidimensional aspects of being gifted. The GRS is a screening instrument based on a multi-dimensional model developed by Pfeiffer and Jarosewich in 2003 and:

- is user friendly;

- requires minimal training;

- is scientifically sound;

- includes a standardized sample;

- is designed to be clinically flexible;

- was linked to the Wechsler Intelligence Scale for Children-Fourth Edition (Pfeiffer & Jarosewich, 2007).

The GRS incorporates the Munich Model of Giftedness and Talent. The Munich Model was based on a longitudinal study of giftedness from 1985 to 1989 in Germany and was developed into a multidimensional tool for assessing giftedness by Heller and Hany in 1986. It is a multidimensional model with six scales. The scales consist of intellectual ability, academic ability, creativity, artistic talent, leadership ability, and motivation. This assessment is given to the teacher to rate each student on a 9-point scale divided into three groups: 1 to 3 is below average; 4-6 is average; and 7 to 9 is above average (Pfeiffer & Jarosewich, 2007).

Smutny (2002) recognized:

All research efforts in the field of human behavior concur in

recognizing giftedness as a special feature that can be developed when

identified accurately. As it is known, intelligence tests are not

conclusive means of identification and are merely one of the

instruments used. Students need to be identified on the basis of various

methods. (p. 120)

Achievement Tests

Davis and Rimm (2004) recognized that an important category of

giftedness is a specific academic talent. An indicator of this talent lies in

information derived from standardized achievement tests such as the Iowa

Tests of Basic Skills, the Stanford Achievement Tests, the Metropolitan

Achievement Tests, the SRA Achievement Series, the California Test of Basic

Skills, and the Sequential Tests of Educational Progress. Another assessment

tool that is used to support the identification of giftedness is the Northwest

Evaluation Association's Measure of Academic Progress (MAP).

The Northwest Evaluation Association's Measure of Academic

Progress (MAP) is a computerized adaptive assessment that measures

academic achievement in the areas of language usage, mathematics, and

reading. NWEA's approach is a test-retest reliability and a type of parallel

forms reliability, which consists of students taking the second test or retest

within a six- to twelve-month time period. The second test compared to the

first test is different in the difficulty level, but the content and structure is comparable to the first test (Northwest Evaluation Association, 2004). Each time a correct answer is chosen, the following question will be more difficult. At the end of the assessment the student will receive a Rasch UnIT (RIT) score. This scale shows whether a student has made growth in each area. The validity of NWEA tests is carefully mapped using existing content standards from a district or a state (Northwest Evaluation, 2004). Test items are selected on a specific test based on their match to the content standards as well as on the difficulty level of the test being created.

Davis and Rimm (2004) cautioned educators on two problems that should be considered when using standardized achievement test scores. The first problem is using the grade-equivalent score, which refers to the average score earned by students at a particular grade level. The other problem with standardized achievement test scores is the potential low ceiling score, which does not give an accurate picture of a student's academic ability. A considerable number of students will "top out" or score above the 95th percentile on most achievement tests. The ceiling on standardized achievement tests makes it difficult for gifted students to show significant academic growth. A more accurate picture will be found when children are given a diagnostic assessment using more difficult tests.

Professional Development

A significant problem in the field of gifted education is the lack of
consistency between states regarding qualifications in teacher preparation for
working with gifted learners (Van Tassel-Baska & Johnsen, 2007). As stated
by Tomlinson and Callahan (1992), Renzulli (1994), Reis and Gentry (1998),
and the U.S. Department of Education (1993), consistency in the use of gifted
education "know-how" could improve general education practices (Gentry,
2004). Van Tassel-Baska and Johnsen (2007) stressed the need to conduct
research that examines the effects of teacher preparedness in gifted education
based on the services offered to and performance of gifted and talented
students. Davis and Rimm (2004) concluded that a teacher must recognize the
characteristics of each student and be knowledgeable about the subject matter
and best practices in teaching to provide the best instruction and environment
for gifted learners.

Educating young gifted students in a heterogeneous model will involve
challenges; teachers need the access knowledge about gifted children in
ongoing professional development to meet the needs for higher level thinking.
Research suggests the importance of providing professional development to
all teachers concerning the needs of gifted and talented students (Bangel,
Moon, & Capobianco, 2010). In that same vein, Johnson et al. (2002) noted:

> Meeting the needs of gifted and talented students in the general
> education classroom is a crucial concern for professionals and

advocates of gifted education. With growing emphasis on inclusion

and the pressure to disband special programs for gifted students, it is

imperative that general education teachers be trained to offer

differentiated instruction. (p. 45)

Most training for teachers in gifted education is offered through in-

service workshops even though they have not produced a substantial change

in participants' classroom strategies (Reis & Westberg, 1994). It is

acknowledged that when educators charged with the academic development of

gifted students are given proper training they can meet the needs of gifted

students (Feldhusen, 1997; Hanninen, 1988; Hansen & Feldhusen, 1994).

According to Farkas and Duffett (2008), 65% of classroom teachers reported

that they have had little or no professional development in teaching gifted

students. Providing teachers with coursework and practicum opportunities to

transfer the knowledge on how to differentiate instruction for gifted learners

has proven to be beneficial (as cited in Bangel et al., 2010).

Another training opportunity is professional learning communities.

These communities are a process where staff development happens in the

workplace (DuFour, DuFour, Eaker, & Karhanek, 2004). The creation of

professional learning communities has helped educators rethink how staff

development looks and what it entails. It is different than the traditional

approach of attending a workshop for a day. Professional learning

communities provide teachers with the tools and data to look at what and how

students are learning on a weekly basis. This focus on learning, instead of teaching, is a results-driven way for teachers to reflect on their practice. The method facilitates the development of teachers continuing to learn how to best meet the needs of all learners including students identified as gifted. DuFour and Eaker (1998) agreed that this form of staff development "enables educators to provide challenging, developmentally appropriate curricula that engages students in integrative ways of thinking and learning" (p. 257). Research and experience have demonstrated that widespread, sustained implementation of new practices requires more than a one day workshop (DuFour & Eaker, 1998). In order for teachers to provide a rigorous learning environment for students identified as gifted, they need to engage in the ongoing cycle of inquiry, reflection, dialogue, analysis, and adjustments in their practice.

Providing professional development to all staff on how to meet the needs of all learners benefits all students and builds a community of trust where students take risks. Renzulli (1994) noted that a talent development approach to enrichment learning and teaching that recognizes student interests, strengths, and talents as a basis to educating students should replace the process of diagnosing and remediating of student weaknesses.

According to Johnsen et al. (2002), two factors that are critical in implementing effective practices in professional development include involving all stakeholders, including general education teachers and

specialized teachers for students at both ends of the spectrum, and professional development that must simulate the desired practices. The practices, as well as ongoing and consistent support and resources, need to be clearly defined so that the newly planned strategies will be transferred into the classroom.

Fogarty and Pete (2010) reported that using the professional learning community approach to differentiate instruction helps educators meet the needs of students at all levels, especially gifted students. These authors believe that professional development consists of these seven components:

1. Sustained: Professional development transfers over time with coaching.

2. Job-embedded: Conversations start during professional development and carry over into the team sessions.

3. Collegial: Collaborations are the norm.

4. Interactive: Active, engaged learning is modeled throughout.

5. Integrative: Differentiated learning is applied to adult learners.

6. Practical: Participants can use these strategies in their classroom the next day.

7. Results-oriented: The goal is change in practice that impacts student achievement (p. 32 & 33).

VanTassel-Baska et al. (2008) examined heterogeneous classroom teachers' instructional behavior as they implemented research based

curriculum units, engaged in professional development, and partnered with a university to improve their students' reading and critical thinking skills. They studied a cohort of 71 teachers who were provided extensive professional development that included workshops, observations, and specialized curriculum. The participants consisted of teachers over a three-year period with third-, fourth-, and fifth-grade students. One of the instruments used to assess teachers for the study was the Classroom Observation Scale –Revised (COS-R) and the other was the Student Observation Scale (SOS) which assessed student engagement behaviors. In this study the results indicated that teachers required three years to learn to utilize a strategy successfully.

The participants in the study (including the experimental and comparison group) had three days of summer training. Participants reviewed the project implementation guide and were provided training on teaching models with differentiated training topics throughout the three years. The curriculum implemented with the experimental group was the William and Mary language arts curriculum based on the integrated curriculum model (ICM). The comparison group continued to teach district-provided curriculum. This curriculum of William and Mary's was composed of three interrelated dimensions: (a) advanced content; (b) higher order processes and products; and (c) conceptual understanding (VanTassel-Baska et al., 2008).

Results of the VanTassel-Baska et al.'s (2008) study showed that the experimental and comparison teachers employed four dimensions of the scale

more frequently than before the study. These consisted of curriculum planning and delivery, accommodations for individual differences, critical thinking strategies, and creative thinking strategies. Although results were shown from the comparison teachers, the experimental teachers obtained higher ratings on all the behavioral categories. Overall, after three years of the project, the experimental teachers utilized the strategies, as a result of professional development, with a significantly higher level of frequency than the comparison teachers. Based on the COS-R total scale and subscale, students in the experimental group showed a higher level of engagement in their work as well as in all instructional categories.

Research conducted by Bangel, Moon, and Capobianco (2010) demonstrated that training teachers in gifted education provided the knowledge they needed to meet individual needs and also resulted in a positive relationship with their gifted students. The participants were undergraduates in an elementary education program who were first-time instructors in the Saturday enrichment program. The participants had also chosen to participate in an online gifted education course that required 45 readings on gifted education, nine 2-hour sessions per week of instructing high ability learners (Saturday enrichment class), and videotaping themselves teaching during the practicum twice during the 9-week time period.

Several themes emerged from the findings including that participants perceived they did not receive the training they needed in their pre-service

program, and lacked the experience and training they felt they needed to work with high-ability students. As their knowledge of gifted students increased through the online course and practicum, their confidence in teaching also increased. Many noted that teaching in this program and study was a more realistic teaching experience than other field experience (Bangel, Moon, & Capobianco, 2010).

Teachers must be knowledgeable of the content, the interests of the students, and be comfortable teaching high-ability students for gifted learners to be successful (Smutny, 2002). Researchers Wycoff, Nash, Juntune, and Mackay (2003) concurred, noting:

Maximum academic achievement for gifted and talented students can only be accomplished when teachers are given the tools, support, and training needed to strengthen instructional skills and develop knowledge of the social and emotional needs of the students they serve. (p. 34)

Student/teacher relationships have also been shown to influence outcomes. A study conducted by Hunsaker, Nielsen, and Bartlett (2010) measured the relationships of teacher practices that influenced cognitive and affective student outcomes. The study consisted of 411 fourth-through sixth-grade students who were identified as Advanced Readers at Risk (ARAR). Thirty-seven teachers participated in the study over a three-year period. The My Class Activities (MCA) instrument was implemented and pre-and post-

literature analysis was used to measure student outcomes. The Developmental Implementation Guide (DIG) was used as the rubric for teacher observation. This rubric delineated six components of teacher practice and specific standards for levels of performance: (a) identification of advanced readers; (b) organizing for instruction; (c) content; (d) instructional strategies; (e) continuous improvement assessment; and (f) ambassador for ARAR.

The findings showed that there was a correlation between the amount of professional development given to teachers and the increase in reading attitude and literary analysis of Advanced Readers at Risk (ARAR). The high level and length of professional development (three years) given to teachers to fully implement an innovation was evident in this study.

Research that can be traced to the 1920s has consistently shown that changing the general education classroom to meet the needs of gifted learners is a slow process that needs support from many areas, including quality professional development (Fullan, 1993). Research is limited in regard to how gifted learners are assessed and what best practices looks like at the elementary level. Within the models listed there is the ability to utilize more than one of them at a time.

Chapter III: Methodology

The purpose of this study was to describe and analyze the effect of academic achievement in reading of gifted students in homogeneous and heterogeneous groupings using quantitative research methods in an elementary setting over a four- year period. The study explored two different models of gifted education. It also included research on the pedagogical and professional knowledge necessary for teachers to increase their awareness of the needs and characteristics of gifted students. The use of two models emerged in this study: heterogeneous and homogeneous. The five other models were found and utilized in the district within these two models. The models explored in this study consisted of differentiation, cluster grouping, within-class grouping, grade advancement/grade skipping, heterogeneous and homogeneous grouping, pull-out programming, and subject acceleration. Within the heterogeneous model, students identified as gifted received pull-out and within-class grouping to meet their needs in reading. The homogeneous model utilized cluster grouping, pull-out, subject acceleration, and within-class grouping in the subject of reading. The one difference between both models was the ability to have the Gifted and Enhanced Learning (GEL) teacher co-teach in the homogeneous classroom as a result of having all 27 students identified as gifted in one class. It recognized the different tools used by the GEL teachers throughout the district in assessing students in determining whether they qualify for gifted services at the

elementary level. "The clear end is to develop the individual as an intellectual, one who has the interest or desire to continuously learn beyond what we teach him" (Rubenstein, 2011, p. 366).

In the review of the literature, researchers proposed alternate ways the classroom environment can be adapted to meet the needs of gifted learners and acknowledged the need for current research on the appropriate model to provide an environment where gifted learners strengthen their skills in academic and creative thinking.

Research Question

This study focused on the effectiveness of the program delivery models used by elementary schools in a Midwestern location. The study described and analyzed the academic achievement in reading of 27 gifted students placed in a homogeneous classroom during their fifth-grade school year and compared the results with gifted students in three other elementary schools in heterogeneous groupings. The longitudinal data examined was from spring 2010 through spring 2014. Reading scores from the children identified as gifted in the 2009-2010 school year were tracked until the students entered ninth grade to determine any long term impact on the homogeneous grouping during their fifth-grade year. The following question was explored:

1. What are the differences in academic achievement in reading over a four-year period between students who are educated in heterogeneous and homogeneous gifted education program delivery models?

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Hypotheses

H1o: There is no difference in student academic achievement in reading over time between heterogeneous groupings of gifted students and homogeneous groupings of gifted students.

H11: There is a difference in student academic achievement in reading over time between heterogeneous groupings of gifted students and homogeneous groupings of gifted students.

Overview of Research Method and Design

The methodology that was used for this study employed a quantitative approach. Muijs (2011) described quantitative research as collecting numerical data to explain a particular phenomenon where the data that we need to collect may already be available to us in numerical form. Creswell (2009) specified that the process of quantitative research is examining the relationship between variables to test objective theories. Quantitative research provides greater breadth and depth to the explanation of the data and further knowledge in that field of research or education (Roberts, 2010). Muijs (2011) suggested that, when doing an experiment, it is best to only concentrate on those variables that we want to study and to control the environment.

Setting

The study took place in the natural setting of four elementary schools in a suburban school district in the Midwest. Ethnic minorities comprised 11% to 18% of the student population. The two highest were of Asian and Hispanic

origin. The majority of students' ethnic origin is White. Students qualifying for free or reduced lunch ranged from 11% to 29%. The range of students receiving special education services ranged from 83 to 112 depending on the school. This study focused on the Gifted and Enhanced Learning (GEL) program in a large, 6,500 K-12 student population, located in a suburban school district in the Midwest. Each school was provided a GEL teacher to assist in meeting the needs of gifted and high potential learners through supporting cluster classrooms and advanced math classes, identification of students, teaching enrichment and academic groups, guiding research in gifted opportunities, and supporting students and their families.

The school district that provided the Gifted and Enhanced Learning program overall has a mission that stated (2013):

Administrators, teachers, parents and community members will work together to identify, using multiple criteria, exceptional learners that demonstrate intellectual, creative and leadership abilities beyond expectations of their chronological age. We will ensure an experience in school that guarantees differentiated instruction in a rigorous environment designed to support and challenge gifted students intellectual, creative, social and emotional needs, producing self-directed lifelong learners and leaders.

Students receive Gifted and Enhanced Learning options in multiple ways. One way to qualify is through cognitive and standardized tests results.

Some of the tests used to qualify for gifted services include the Otis Lenin Ability Test (OLSAT) and The Northwest Evaluation Association (NWEA). Typically students scoring at the 97 percentile or higher on the OLSAT, and/or achievement testing at the 95 percentile or higher on the NWEA are identified for the program. To allow for testing inconsistencies, students with a MAP score of 93% or higher with supporting information are considered for the program.

Educational opportunities are provided to students in two ways: (a) through the regular classroom through a cluster model where differentiation is the foundation of the program; and (b) through the "pull-out" GEL classroom using the level of services model. "Pull-out" refers to the practice of students being pulled out of their regular classes once or twice a week to participate in special enrichment activities (Davis & Rimm, 2004).

There are four different levels of service provided for gifted students in this Midwest school district. The level of service is different than the model of service depending on the school attended in this district. The seven models defined in this study could be within the levels of service. Level one service consisted of the classroom teacher challenging students within the regular classroom; needs are met through individualized instruction using flexible grouping, differentiated instruction, challenging academic content and skill development, as well as extra classroom opportunities.

Level two services are often determined by teacher referral and/or personal or parent choice and include enrichment opportunities within and outside of the school day such as Junior Great Books, Continental Math League, Science Fair, Lego League, Spelling Bee, Creativity Festival, Author's Fair, and book clubs.

Level three services are designed to meet the need for extra challenge and enhanced learning. Students with these needs are eligible based on multiple criteria. Students are generally served in groups with those of similar ability. These services include pull-out classes, cluster classrooms in grades three through five and enrichment math and/or literacy groups, and math acceleration. Pull-out classes are offered in all schools and focus on critical and creative thinking, higher level problem solving, and research. Each building focuses on various topics for in-depth study, with some focus on student interest.

Level four services are for those whose academic needs are significantly different from their peers; students need individualized instruction through things like single subject grade acceleration or grade acceleration. The four levels of Gifted and Enhanced Learning are provided to students identified as gifted and talented through multiple criteria. Variations of the four levels and programming of students identified as gifted differ from one building to another.

All four schools utilize Junior Great Book Clubs for students receiving level two services. School A is the only school that offers Lego League. Pull-out programming is available to all students with level three services. In school A, pull-out programming was in cooperation with the general education teacher that had the twenty-seven students identified as gifted (homogeneous group) during the 2009/2010 school year, which included science and reading. In schools B, C, and D, pull-out programming was used in math and science.

Unit of Analysis

The unit of analysis for this study is the elementary classroom. Each classroom was characterized in terms of: (a) heterogeneous/homogeneous grouping classification; (b) aggregate student achievement (MAP).

Sample Strategy

a. Sample Schools

One school (A) is the homogeneous case.

Three schools (B, C, D) are the heterogeneous cases.

b. Sample Students

The total number of sample students in school A (homogeneous) is 27.

The total number of sample students in schools B, C, and D (heterogeneous) is 51.

c. Sample Time Periods:

Spring 2011, 2012, 2013, 2014

    d. Sample Summary: the study compares 27 students in one

homogeneous school to 51 students in three heterogeneous schools

in and across four different time periods.

Sample Details

The sample for this study consisted of 14 fifth-grade classrooms in four schools in a suburban school district in the Midwest. Within these classrooms, 27 gifted students were homogeneously placed in one classroom in one school. Gifted students were placed in the other 11 heterogeneous classrooms in the other three schools. The study looked at the reading achievement data over time of these 27 students compared to those placed in heterogeneous classrooms that same year. The heterogeneous classrooms consisted of mixed-ability students. Muijs (2011) acknowledged that using existing data is an invaluable resource for researchers and is often inexpensive and more efficient.

The comparison schools were similar in the number of students identified as gifted based on enrollment. All four schools had between 629 to 770 students enrolled in kindergarten through fifth-grade (Table 1). The number of students identified as needing gifted services ranged between 35 and 60 students within the four schools in the study.

Table 1

Students Identified as Gifted 2011/2012

School	Enrollment	Students grades 3-5 identified as gifted (SIG)	Students in grade 5 identified as gifted (SIG)	Number of sections in 5th grade
A	770	60	27	3
B	693	35	15	4
C	629	44	16	3
D	661	47	21	4

The schools consisted of students in grades kindergarten through fifth-grade. School C had the lowest enrollment with 629 students and identified 44 students needing gifted and talented services. The next school, according to size with 661 students, was School D servicing 47 students in the gifted and talented program. School B's enrollment is 693 students and had 35 students identified as needing gifted services. School A had the largest enrollment with 770 students and had identified 60 students as gifted and talented. Each school is public and has one half-time Gifted and Enriched Learning (GEL) teacher.

The comparison schools were similar in demographics (Table 2). The district total for the percentage of students who qualify for free and reduced lunches is 16.5%. The percentage of students qualifying for free and reduced lunches spans from 11% to 28% for the comparison schools. Students of color vary from the lowest number of 84 at Elementary A to the highest number of

125 at Elementary School B. These characteristics were not part of the core variables of the study.

Table 2

Demographics for Each School 2011/12

Schools	% of free and reduced lunches	% of students of color	% of students White
A	11	11	89
B	21	18	82
C	28	14	86
D	11	14	86

Attrition occurred throughout the four year study. The base year of this study was 2010/2011 with 27 students in the homogeneous group and 51 in the heterogeneous groups. In 2011/2012 the number of students assessed reduced by six; 2012/2013 the number reduced by an additional four; 2013/2014 by an additional two.

Data Collection Procedures

The data collection method consisted of data on student achievement obtained in aggregate classroom form from Measure of Academic Progress (MAP) sources as part of the Northwest Evaluation Association. Existing data sets with student achievement information using the Measure of Academic Progress (MAP) scores were used to review academic achievement in the homogeneous gifted classroom (level three and four) compared to the heterogeneous classroom in reading. The data for this analysis consisted of MAP spring to spring reading scores from 2010 through 2014.

Data Analysis

The independent variable is heterogeneous/homogeneous grouping classification. The dependent variables are all continuous and consist of aggregate student achievement (MAP). For the comparison between homogeneous and heterogeneous groups of students' achievement levels in reading, growth from spring 2010 to spring 2014 was used. The scores came from the Measures of Academic Progress (MAP) assessment.

A series of 2-Independent Sample T-Tests were used to examine the difference between the means of the continuous dependent variable for the heterogeneous and homogeneous groupings. The student data was separated by enrichment level and those receiving pull-out services by the gifted teacher.

Limitations and Delimitations

The study was limited in both sample size and demographics. The total sample of students consisted of 78 students with the majority of White ethnicity. Another limitation was the use of convenience sampling. There is a possibility of bias any time data are obtained from this type of sampling. Another bias was that the researcher is an administrator in the district. The intent of this study was to determine whether the homogeneous or heterogeneous model of placing students identified as gifted in classrooms is beneficial to their growth in reading. The fact that the researcher is an

administrator in the district did not impact the study procedures nor study conclusions.

Ethical Considerations

Creswell (2009) stated that "researchers need to protect their research participants; develop a trust with them; promote the integrity of research; guard against misconduct and impropriety that might reflect on their organization or institutions; and cope with the new, challenging problems" (p. 87). The study was approved by the Institutional Review Board (IRB) as it found that the research involved no more than minimal risk to the subjects.

Chapter IV: Results

Introduction

This quantitative study was intended to help educators determine the relative effectiveness of the program delivery models focused on the homogeneous grouping of gifted students in reading in an elementary setting. The purpose of this quantitative study was to compare and analyze the effects of academic achievement in reading of gifted students in homogeneous and heterogeneous groupings in an elementary setting over a four-year period.

The study explored two different models of gifted student education. There are many factors that may influence gifted students' growth in reading. The use of two models emerged in this study: heterogeneous and homogeneous. Within the heterogeneous model, students identified as gifted received pull-out and within class grouping to meet their needs in reading. The one difference between both models was the ability to have the gifted and enhance learning (GEL) teacher co-teach in the homogeneous classroom as a result of having all twenty-seven students identified as gifted in one class. The homogeneous model utilized cluster grouping, pull-out, subject acceleration, and within class grouping in the subject of reading instead of utilizing pull-out for reading.

The data collection consisted of data on student achievement obtained in aggregate classroom form from Measure of Academic Progress (MAP) sources as part of the Northwest Evaluation Association. Existing data sets

with student achievement information using the Measure of Academic Progress (MAP) scores were used when looking at academic achievement in the homogeneous gifted classroom (level three and four) compared to the heterogeneous classroom in reading. The data for this analysis consists of MAP spring-to-spring reading scores from 2010 through 2014.

The Northwest Evaluation Association's (NWEA) Measure of Academic Progress assessment is used by more than 2,700 school districts, which includes over 5.1 million students (https://www.nwea.org/). The Measures of Academic Progress (MAP) is a computerized adaptive assessment that provides a personalized testing experience for each student by adapting to each student's learning level. If a student answers a question correctly, the test follows up with a more difficult question. If a student answers incorrectly, the test follows up with a simpler question. By regulating the difficulty of items, MAP accurately measures the achievement and growth of every student throughout time. At the completion of the assessment, each student receives a RIT score (Rasch UnIT). The RIT scores are centered on the same modern test theory that aligns student achievement levels with the difficulty of each item on the same scale (Asperheim, 2010). Students receive their own target growth number depending on the results of their test.

<div align="center">Research Question and Hypotheses</div>

The results of this study included a detailed analysis of independent and dependent variables intended to answer this research question:

1. What are the differences in academic achievement in reading over a four-year period between students who are educated in heterogeneous and homogeneous gifted education program delivery models?

This study sought to find out if there was a positive correlation between gifted students being placed in a homogeneous classroom setting and academic achievement in reading. The following are the hypotheses associated with this research:

Null Hypothesis

- H1o: There is no difference in student academic achievement in reading over time between heterogeneous groupings of gifted students and homogenous groupings of gifted students.

Alternative Hypothesis

- H11: There is a difference in student academic achievement in reading in over time between heterogeneous groupings of gifted students and homogenous groupings of gifted students.

The sample for this study consisted of 14 fifth-grade classrooms in four schools in a suburban school district in the Midwest. Within these classrooms, 27 gifted students were homogeneously placed in one classroom in one school. Gifted students were placed in the other 11 heterogeneous classrooms in the other three schools. The study looked at the reading achievement data over time of these 27 students compared to those placed in

heterogeneous classrooms that same year. The heterogeneous classrooms consisted of mixed-ability students.

The comparison schools were similar in the number of students identified as gifted based on enrollment. All four schools had between 629 to 770 students enrolled kindergarten through fifth-grade (Table 1, also shown in chapter two). The number of students identified as needing gifted services ranged between 35 and 60 students within the four schools in the study.

The schools consisted of students in grades kindergarten through fifth-grade. School C has the lowest enrollment with 629 students and had identified 44 students needing gifted and talented services. The next school according to size with 661 students was School D servicing 47 students in the gifted and talented program. School B's enrollment was 693 students with 35 students identified as needing gifted services. School A had the largest enrollment with 770 students and had identified 60 students as gifted and talented. Each school is public and had one half-time gifted and enriched learning (GEL) teacher.

<center>Data Analysis</center>

The purpose of this study was to describe and analyze the effect of academic achievement in reading of one cohort of gifted students who were placed either in a homogeneous class or in heterogeneous classrooms within the district over a four-year period using quantitative research methods. This chapter presents an analysis of the data collected from the Measure of

Academic Progress (MAP) using NWEA as the assessment on the effectiveness of placing gifted students in homogeneous or heterogeneous instructional settings and the program models provided for these students. The Northwest Evaluation Association's Measure of Academic Progress (MAP) is a computerized adaptive assessment that measures academic achievement in the areas of language usage, mathematics, and reading. These scores were collected from the school district archives for the analysis.

A quantitative approach was the methodology used for this study. The sample for this study consisted of 14 fifth-grade classrooms in four schools in a suburban school district in the Midwest. Within these classrooms, 27 gifted students were homogeneously placed in one classroom in one school. Gifted students were placed in the other 11 heterogeneous classrooms in the other three schools. The study looked at the reading achievement data over time of these 27 students compared to those 51 students placed in heterogeneous classrooms that same year. Statistical functions to analyze the data included descriptive statistics including group means using nominal and continuous variables of measurement using the t-test. The program utilized to analyze the data was Microsoft Access. For both hypothesis using t-tests, the means and standard deviations are presented along with the p-value for rejection or non-rejection of the null hypothesis. The alpha level was selected at .05. Tables are provided to display findings.

Table 3

NWEA Comparison Table: MAP RIT Reading Scores From Spring to Spring beginning 2011 through 2014. "School A being the homogeneous grouping model"

Schools	# of students (SIG)	Average RIT Score Spring 2011	Average RIT Score Spring 2012	Average RIT Score Spring 2013	Average RIT Score Spring 2014
A	27	219.15	229.81	231.92	235.09
B	15	218.62	228.4	232.67	231.57
C	16	225.73	231.88	232.6	236.79
D	20	221.95	227.3	232	235.7

Hypothesis H1o (Addressing the Research Question)

Hypothesis 1 (H1o) addresses the research question: What are the differences in academic achievement in reading over a four-year period between students who are educated in heterogeneous and homogeneous gifted education program delivery models?

The null hypothesis was there is no difference in student academic achievement in reading between heterogeneous groupings of gifted students and homogeneous groupings of gifted students.

Null Hypothesis H1o was not rejected as the growth of the twenty-seven students did not show a significant increase in Reading RIT scores compared to the other schools. Both groups demonstrated growth, but there

was not a significant difference in the actual growth between the two groups. The gifted students placed in the homogeneous group showed higher RIT scores in 2011, 2012, and 2014 compared to one other school with 235.09 compared to 231.57. On average, the other two schools that provided heterogeneous groupings for students identified as gifted had higher RIT scores than the homogeneous grouping of students. In 2013, the homogeneous group had the lowest scores. Overall the homogeneous did not show a continuous amount of growth compared individually to the other three schools over a four-year period, but showed the greatest amount of growth from 2011 to 2014 going from 219.15 to 235.09.

Table 4

RIT 2011-2014 Spring Scores for Homogeneous and Heterogeneous Models.

Models	Average of Total Spring 2011 Reading- Test RIT Score 5th grade	Average of Total Spring 2012 Reading- Test RIT Score 6th grade	Average of Total Spring 2013 Reading- Test RIT Score 7th grade	Average of Total Spring 2014 Reading- Test RIT Score 8th grade
Homogeneous	219.15	229.81	226.35	235.09
Heterogeneous	222.23	229.06	227.63	234.81
Total	221.15	229.32	227. 19	234.9

Table 5

Spring Norm RIT Scores

Grade Level	Norm RIT Scores	Average Growth
4	205.9	7.8
5	211.8	6.1
6	215.8	4.8
7	218.2	3.7
8	220.1	2.8

Hypothesis 11 was: There is a difference in student academic achievement in reading between heterogeneous groupings of gifted students and homogenous groupings of gifted students.

In the spring 2011 the heterogeneous group had a higher average RIT score than the homogeneous group. This was the first year that the homogeneous group was placed together as one homogeneous group in a fifth-grade classroom. In the spring of 2012 the homogeneous group showed an increase of 10 points compared to the heterogeneous group with 7 points (Table 4). This increase in average RIT score was not consistent for the next two years. In 2013 the heterogeneous group had higher RIT scores than the homogeneous group. This table shows there was a difference over a three-year period, but not a consistent difference. The last year shows that overall the homogeneous group showed a higher average total RIT score in achievement in reading.

Table 6

NWEA Grade 4 to 5 Group Statistics

	Gr 4 to Gr 5 Growth	
	t-Test: Two-Sample Assuming Unequal Variances	
		Variable 1	*Variable 2*
	Mean	6.604167	10.61538
	Variance	38.62722	31.84615
	Observations	48	26
	Hypothesized Mean Difference	0	
	df	56	
	t Stat	-2.81561	
	P(T<=t) one-tail	0.003355	
	t Critical one-tail	1.672522	
	P(T<=t) two-tail	0.006709	
	t Critical two-tail	2.003241	

 *significant level if t Stat exceeds the Critical two-tail

Using the t-test for independent samples, the Null Hypothesis HIO was

not rejected as the t- Stat did not exceed the Critical t value (Table 6).

Variable 1 is the heterogeneous group and variable 2 is the homogeneous

group of students.

Table 7

NWEA Grade 4 to 6 Group Statistics

Gr 4 to Gr 6 Growth			
t-Test: Two-Sample Assuming Unequal Variances			
	Variable 1	*Variable 2*	
Mean	9.702128	12.88	
Variance	50.3876	38.69333	
Observations	47	25	
Hypothesized Mean Difference	0		
df	55		
t Stat	-1.96337		
P(T<=t) one-tail	0.027334		
t Critical one-tail	1.673034		
P(T<=t) two-tail	0.054668		
t Critical two-tail	2.004045		

An independent samples t-test indicated that the homogeneous group had more average growth (M = 12.8, SD = 6.22) compared to the heterogeneous group (M = 9.7, SD = 7.09) (Table 6). Using the t-test for independent samples, assuming unequal variances, there was not a significant

difference between the homogeneous and heterogeneous groups of students (t

= -1.96, df = 55).

Table 8

NWEA Grade 4 to 7 Group Statistics

	Gr 4 To Gr 7 Growth			
	t-Test: Two-Sample Assuming Unequal Variances			
		Variable 1	*Variable 2*	
	Mean	12.57447	15.7619	
	Variance	34.42368	45.09048	
	Observations	47	21	
	Hypothesized Mean Difference	0		
	df	34		
	t Stat	-1.87835		
	P(T<=t) one-tail	0.034465		
	t Critical one-tail	1.690924		
	P(T<=t) two-tail	0.068931		
	t Critical two-tail	2.032245		

The biggest decrease in the degrees of freedom (df) occurred from

sixth grade at 55 to seventh grade at 34. This degrees of freedom is also seen

in table four showing the attrition over the four year study. The observed

difference between 12.57 and 15.76 is not enough to state that there is a

significant difference in reading growth between homogeneous and heterogeneous groupings. The mean score for variable 1 (M=12.57, SD= 5.86, N= 47) was significantly smaller than the scores for variable 2 (M=15.76, SD=6.71, N= 21) using the two-sample t-test for unequal variances, $t (34) = 1.88$, $p <= 0.067$ (Table 7). This provides evidence to not reject the null hypotheses of equal means.

Table 9

NWEA Grade 4 to 8 Group Statistics

	Gr 4 to Gr 8 Growth		
	t-Test: Two-Sample Assuming Unequal Variances		
		Variable 1	*Variable 2*	
	Mean	16.88636	20.59091	
	Variance	55.68446	74.72944	
	Observations	44	22	
	Hypothesized Mean Difference	0		
	df	37		
	t Stat	-1.71567		
	P(T<=t) one-tail	0.047294		
	t Critical one-tail	1.687094		
	P(T<=t) two-tail	0.094587		
	T Critical two-tail	2.026192		

On average, the homogeneous group scored 3.18 points higher on the MAP

test than the heterogeneous group of students from Grades 4 to 8 (Table 8).

The spread of numbers also increased from being 5.63 SD in fourth to fifth-

grade to 8.6 SD from fourth to eighth grade, therefore, The two-tail values

were used for the analysis. Since the t statistic < t critical (1.72 < 2.03) and p

value > a (0.09> 0.05), The null hypothesis cannot be rejected because the

means are the same.

Table 10

Average of NWEA MAP reading growth Grades 4 to Grades 8

Students (SIG)	Average of NWEA MAP reading growth Gr 4 to Gr 5	Average of NWEA MAP reading growth Gr 4 to Gr 6	Average of NWEA MAP reading growth Gr 4 to Gr 7	Average of NWEA MAP reading growth Gr 4 to Gr 8
Homogeneous 27	10.62	12.88	15.76	20.59
Heterogeneous 51	6.60	9.70	12.57	16.88
Total 78	8.61	11.29	14.17	18.74

The total percentage of students showing growth in reading from Grades 4 to 5 was analyzed using t-test procedures. The growth of students from fourth grade to sixth grade and then to seventh grade was the first dependent variable utilized in the analysis. For this analysis, the year from Grade 4 to 5 demonstrated a difference in growth of 4.0, which was the greatest difference of the comparisons. The average RIT score for the homogeneous group showed more growth in seventh grade compared to the heterogeneous group.

Summary of findings

The intention of this quantitative study was to contribute to the body of knowledge that is needed in order to determine the relative effectiveness of homogeneous and heterogeneous groupings of gifted students in reading. The purpose of this study was to describe and analyze the effect of academic achievement in reading of gifted students in homogeneous and heterogeneous groupings. This study looked at the long-range growth in the areas of reading using one group of students placed in a homogeneous gifted classroom for one year in fifth-grade.

Chapter V: Discussion, Implications, Recommendations

Overview of the Study

With educational reforms, schools nationwide are experiencing increased demands for assessments and accountability. The No Child Left Behind Act (2001) dramatically changed how education was delivered and funded. It provided lower achieving students with resources to increase their scores on high stakes tests. As a result of a reduction in funding for gifted programming, gifted students were placed in heterogeneous classrooms. How well are schools serving students identified as gifted? A closer look at the test data internationally shows only a small percentage of students reach the highest levels of achievement. So what are schools doing to support and extend the learning for gifted students. Educators grapple with this question weekly, if not daily. We need to provide an environment in which gifted students can reach their fullest potential.

Academic achievement and learning development depend on the fit of the educational environment to the specific abilities and needs of the individual learner (Heacox, 2009). The prominent characteristic of a student identified as gifted is their high cognitive ability. Research has shown that it is critical for gifted students to be challenged academically and to be with peers of equal intellectual ability to prevent motivational, emotional, and social problems (Robinson, 2002). The heart of effective programming for gifted students lies in the knowledge of using integration of advanced curricula

along with providing the best model of instruction. This type of model would include effective instructional strategies to develop learning activities that will enhance the education for gifted students.

Although research is limited, it has been theorized by gifted education researchers that specialized settings or models are beneficial for students identified as gifted (Eddles-Hirsch, et al, 2010). It is also questionable whether gifted students are getting their academic needs met in the heterogeneous classroom (Firmender, Reis, and Sweeny, 2013). Educators work with students at all levels across the spectrum of cognitive ability. This type of instructional setting can cause gifted students to become frustrated and lack confidence in their ability (Winebrenner, 2001).

The goal of gifted education is to develop the individual as an intellectual who has the desire and interest to continuously learn beyond what is taught in the classroom (Tomlinson, Brighton, Hertberg, Callahan, Moon, Brimijoin, & Reynolds, 2003). Services and models for gifted learners are impacted in times of budget constraints. Additionally, schools have been impacted by the No Child Left Behind Act (2001) requiring American public schools to validate, through summative assessments that all students receive the same or equal access to educational funding (Mendoza, 2006).

The sample population used for this study included 78 students identified as gifted in four elementary schools in a Midwestern location. The district total for the percentage of students who qualified for free and reduced

lunches was 16.5%. The demographics for each of the schools was similar enough that the decision was made to not include them as variables (Table 2). These characteristics are not part of the core variables of the study.

The sample for this study consisted of 14 fifth-grade classrooms in four schools in a suburban school district in the Midwest. Within these classrooms, 27 gifted students were homogeneously placed in one classroom in one school. Gifted students were placed in the other 11 heterogeneous classrooms in the other three schools. The study looked at the reading achievement data over time of these 27 students compared to those placed in heterogeneous classrooms that same year. The heterogeneous classrooms consisted of mixed-ability students.

School based data was collected on student achievement obtained in aggregate classroom form from Measure of Academic Progress (MAP) sources as part of the Northwest Evaluation Association. Existing data sets with student achievement information using the Measure of Academic Progress (MAP) scores were used when looking at academic achievement in the homogeneous gifted classroom compared to the heterogeneous classrooms in reading. The data for this analysis consisted of longitudinal MAP spring to spring reading scores from 2010 through 2014. A series of 2-Independent Sample t-tests were used to examine the difference between the means of the continuous dependent variable for the heterogeneous and homogeneous groupings.

In order to determine if the data showed a significant difference in the homogeneous and heterogeneous groupings, a t-test of the two variables assuming unequal variances was used. The Microsoft Access QI Macros Statistics was used for each grade level beginning at fourth grade and ending with eighth grade scores in reading. Measure of Academic Progress (MAP) scores were analyzed by comparing the Rasch UnIT (RIT) score. This scale shows whether a student has made growth in each area by program type. The independent variable was the 78 students that were part of the study. The NWEA MAP RIT scores were used as the covariates because these scores measured student achievement prior to the beginning of the cluster grouping.

Research Question and Conclusions

The final results of this study included detailed analysis of independent and dependent variables intended to answer the question: What are the differences in academic achievement in reading over a four-year period between students who are educated in heterogeneous and homogeneous gifted education program delivery models?

In order to distinguish between the two independent variables, scores were collected using the homogeneous group, which consisted of the 27 students placed in one classroom and the heterogeneous group, which consisted of GEL students placed in mixed-ability groups. The data was also grouped using growth in reading beginning at fourth-grade and then compared

at each grade through eighth- grade. Spring RIT scores were used at each level beginning in 2011 for each school.

Using the t-test for independent samples, there was not a significant difference between the homogeneous group and the heterogeneous group when looking at their growth in reading over a four-year period. The mean showed that the homogeneous group was higher each year, but it was not enough of a difference to be considered significant. The results showed that the students in the homogeneous group showed no statistically significant difference in their scores.

The average growth using the Measure of Academic Progress (MAP) data showed that from grade four to seven there was an average of a three-point difference in the homogeneous group in reading. Although statistically the t-test showed there was not a significant difference in the model of gifted education, the data based on this study, comparing the growth of the RIT scores, the 27 students grouped homogeneously may have benefited from the this model. The results demonstrated a positive but non-significant relationship in growth in reading in a homogeneous grouping.

A foundational assumption to this research was that there was a positive correlation between the homogeneous model and growth in reading. As determined by this research study, the data showed a positive correlation in growth, but not significant looking at the Measure of Academic Progress reading growth scores comparing the homogeneous model of instruction for

gifted students and the heterogeneous group of students receiving pull out instruction during their fifth-grade year by tracking reading progress over a four-year period of time.

The grouping of the 27 fifth-grade students in one classroom allowed for the teacher to differentiate at an accelerated level and make appropriate instructional modifications. This allowed for students to be challenged at the appropriate level. Gifted students were given work content that created an environment where they needed to give their best effort and not just be satisfied; these were lifelong skills, which included frustration with pushing to get to the next level. The differentiation included faster-paced, project-based instruction that was primarily driven by student interests.

Homogeneous grouping allows for gifted students to receive instructional attention directly aimed at the rigor necessary for them to continue to learn at high levels and directly affect the curriculum and instruction in the classroom (Adelson et al., 2012). It allows students to be with like-minded peers which allows for more acceleration, rigor, and differentiation at another level (Adelson et al., 2012). Students in the homogeneous classroom had more subjective observable outcomes, not necessarily shown on MAP growth scores, that related to critical thinking, problem-solving and leadership. It also allowed for co-teaching between the fifth-grade teacher and the gifted teacher.

Implications of Findings

The intention of this study was to identify the best model of instruction that would provide the most beneficial growth in reading of students identified as gifted. Although there is currently more research on gifted education, it doesn't necessarily pertain to what is the best model in meeting the needs of gifted learners. There are many types of models utilized in education to meet the needs of gifted learners. Renzulli, Gentry, and Reis (2004) stated that the most frustrating issue to teachers is when students with high ability are not reaching their potential.

An important understanding is realizing the instructional possibilities for gifted students in a homogeneous classroom. It is imperative that administrators and people in education continue to research and learn about how to provide the best model for gifted students. Then the goal would be to provide gifted students classrooms with certified teachers who will create learning environments that foster critical thinking.

The findings of this study indicate that the homogeneous group of students did make positive growth in reading according to the Measure of Academic Progress over a four-year time period using the t-test for independent samples. It also showed that their growth increased at a more rapid rate than that of the heterogeneous group perhaps due to the small sample size, but wasn't significant enough in this study. The more gifted

students in a classroom, the more enhanced learning opportunities and higher level thinking were made available.

Research continues to demonstrate that it is necessary to provide teachers with opportunities by engaging them in the ongoing cycle of inquiry, reflection, dialogue, and analysis, so that they will continue to make adjustments in their practice (as cited in Bangel et al., 2010). Sustainable implementation of new practices requires more than a one-day workshop (DuFour & Eaker, 1998). It is important to create a school environment where gifted learners will have the opportunity to excel.

<center>Recommendations for Academic Research</center>

This study focused on the effectiveness of the two different program delivery models, homogeneous and heterogeneous, in an elementary school setting. The data showed that there was not a significant difference between the homogeneous group and the heterogeneous group when looking at their growth in reading over a four-year period using the t-test for independent samples. Although a significant difference between the two groups was not shown, growth was seen when comparing the two groups when looking the RIT scores. One recommendation for further studies would be to replicate the study in a school district that uses similar data. It would also be beneficial to conduct this study in a larger district that employs many gifted teachers so that the sample size is greater and may show stronger correlations that have more value.

The second recommendation is to look at how students are identified as being gifted. Utilizing a more authentic tool to identify students along with in which areas are they gifted would be beneficial for the future of educating gifted students. Using multiple tools like formal methods along with informal diagnostic instruments such as teacher and parent checklists provide important supplementary information (Heller, 2004).

Another recommendation is to conduct a study on the differentiation provided by teachers in the homogeneous and heterogeneous classrooms along with how much professional development is provided. The study could include a deeper investigation of the teaching styles that impact the student outcomes. This research should be conducted to find out if the total amount of differentiation in a heterogeneous classroom is linked to the amount of professional development given to teachers.

One more recommendation is to collect longitudinal data on gifted students in their adult lives. This might include a survey to include data on how successful they are as an adult. It could also include how they felt in a homogeneous grouped setting.

The final recommendation for this study is to look at whether specialized curriculum provided to the teacher has an impact on meeting the needs of gifted students. This study could investigate using a special curriculum, such as Contract Activity Packages or the Schoolwide Enrichment Model, along with how it is implemented with increasing the amount of time

provided for professional development for each teacher. The professional development would be a prescribed amount of time and authentic activities completed by the teacher. Incorporating professional development with the special curriculum is necessary to increase the frequency of differentiating (Johnson et al., 2002). This plan should be developed as instructional expectations expand over time.

Recommendation for Practice

One recommendation is for teachers to receive appropriate professional development that is designed to meet the needs of students identified as gifted. While teachers in Minnesota are required to have their gifted and talented endorsement, an extended plan should be in place to provide professional development for all teachers on how to meet the needs of gifted students. This professional development would include how to differentiate for gifted students.

Another recommendation would be to work collaboratively with the gifted teacher. Although the data was not significant in increasing reading scores for the homogeneous group, the feedback from the students, general education teacher and gifted teacher was positive in responding to the two teachers co-teaching the literacy instruction for the homogeneous group of students.

Concluding Comments

This study was developed to show the differences in academic achievement in reading over a four-year period between students who were educated in heterogeneous or homogeneous gifted education program delivery models. This study showed that there was growth in the homogeneous grouping over a four-year period of time, but not significant enough to reject the null hypothesis.

With the emphasis on providing equal opportunities for all students, the use of inclusion for gifted students, and with limited resources and increased class sizes, many teachers have found it difficult to meet individual needs in the heterogeneous classroom. The data showed that when gifted learners are placed together with students of similar abilities in a homogeneous or heterogeneous setting they are motivated and engaged to grow in reading according to the NWEA.

The ultimate goal is for students identified as gifted to have the desire to achieve at a high level beyond what is being taught. They need to have the skills to understand how to participate to maintain their identity as individuals. Recent studies have revealed that the everyday school life of nearly seven out of 10 high-ability students is spent in learning environments that are not suitable to their learning needs (Assouline, Colangelo, Heo, & Dockery, 2013).

Current research also revealed that educators remain guilty of doing what we know is ineffective for high-ability students, which is placing bright students in heterogeneous groupings with little academic support. For gifted students to be successful, it is necessary for them to learn the relationship between their efforts and results. Placing gifted learners in a classroom where they feel challenged will increase their desire to learn beyond what is taught by the teacher (Rubenstein, 2011).

The need to differentiate instruction and curriculum in a variety of delivery models has never been more apparent as gifted and talented students are placed in heterogeneous classrooms. Incorporating a variety of options for gifted students will increase students' participation and increase their independence in their learning. It is our moral obligation to provide a rich learning experience for all students so that they can actualize their potential and learn at their highest level while creating an optimal learning environment for all students.

It is our responsibility to provide equity for all students to actualize their potential and to be able to learn at their highest level while creating an optimal learning environment for all students. In the meantime, the data from this study suggests that there was growth in reading when students are placed in either grouping. We should continue to search for the best model of educating students identified as gifted. Gifted students must be freed from the same curriculum and moving at the same pace as their classmates. They must

be provided the classroom setting and materials that promote critical thinking using complex and advanced materials. Adelson, McCoach, and Gavin (2012) stated that more rigorous research is necessary to determine the best programming and the best model to increase achievement for gifted learners. It is critical that we continue to seek knowledge and move forward in our quest to meet and exceed the needs of gifted learners who may very well be our future leaders.

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