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Single-Sex Classrooms: Effects of Boys' Achievement A Meta-Analysis

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Single-Sex Classrooms: Effects of Boys' Achievement
A Meta-Analysis

by

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Brockport, State University of New York in partial fulfillment of the requirements for the degree
of Master of Science in Education

Abstract

Research has shown that there is an increasing achievement gap occurring within the boy population regardless of age, ethnicity, or culture. They are differing reasons as to why this may be occurring, some being; poor literacy education in lower grades, dismissal of reading instruction in the upper grades, a lack of appropriate role models for boys, insufficient desirable text for boys, and unrealistic expectations pushed on boys too soon. A strategy in addressing this problem that is becoming increasingly popular is the implementation of single-sex classrooms. There is much debate on whether this is an effective strategy as researchers attempt to fill in the gaps associated with the implementation of single-sex classrooms. By conducting a meta-analysis on the past and current research on single-sex classrooms and its effects on boys' achievement, I found the research to be inconclusive. Within this meta-analysis, the numerous factors that play a role in the effectiveness of single-sex classrooms are discussed. Some of these factors include; methodological weakness, teacher pedagogy and perceptions, student perceptions and culture.

Table of Contents

Chapter One: Introduction	
Introduction.....	1
Problem Statement.....	2
Purpose.....	5
Rationale.....	6
Methodology.....	7
Chapter Two: Literature Review	
Introduction.....	8
The Achievement Gap.....	9
“Boys will be Boys”.....	12
Academic Achievement.....	15
Chapter Three: Methods & Procedures	
Positionality of Researcher.....	18
Procedures.....	19
Data Analysis.....	19
Criteria for Trustworthiness.....	20
Chapter Four: Findings.....	21
Chapter Five: Conclusion and Implications.....	35
References.....	39

Chapter One: Introduction

Two mothers are sitting at the playground watching their children play and interact with one another. The mother of the two girls looks over at the mother of the two boys and says, “I’m sure glad I don’t have boys, I don’t know if I could handle it!” The mother of the boys looks at the other mother, smiles and says, “Boys will be boys.” What does that statement actually intend? How are boys supposed to *be*, and how much different are they really than girls? It has become somewhat of a cliché; boys have been stereotyped according to their behaviors and dispositions on what has been deemed normal or attributed to their gender. Are boys actually “wired” differently than girls, as some researchers say? If so, does this affect how they learn as well?

As a mother of two boys, these are questions that frequently come up and have become a recent concern of mine, as my boys start grade school. I see many differences between my boys and my friend’s female children; such as the way they approach playing with more energy and force, not being as attentive or being able to sit for long periods of time, and having completely different interests in play and activities. As a teacher, I have seen differences between boys and girls in the classroom; such as, boys needing more stimulation with lessons and activities, having less of an attention span, and causing more classroom disruptions due to their behaviors which require more teacher attention and loss of instructional time. I have also witnessed boys having less motivation to read and write and being more difficult to engage in lessons. So what is being done to address the differences between sexes in the classroom? If boys and girls approach learning differently, then is it effective to implement the same teaching strategies in a classroom filled with such diverse learning styles, behaviors and academic achievement? Yes, every class will be filled with diverse needs and interests. Current research studies and academic reports

published by various educational entities, such as the National Assessment of Educational Progress (NAEP), suggest boys are falling behind girls academically, especially in the area of literacy. They are losing motivation and engagement due to various reasons that will be discussed in my study. Are the differences in boys and girls significant enough for teachers and educators to consider making changes in how their learning is facilitated?

Problem Statement

Richard Whitmire (2010) expounds on many enlightening facts about boys in his book, *Why Boys Fail*. The facts he shares are evidence that the overall achievement gap between boys and girls is widening, especially in reading and writing. According to the High School Transcripts study done by the U.S. Department of Education, by 2005, girls had a B-grade point average compared to boys having a C-plus grade point average (Whitmire, 2010). Whitmire also discusses that data from the National Assessment of Educational Progress (NAEP), show that nearly 25 percent of White sons of college-educated parents scored “below basic” in reading achievement, compared to only 7 percent of their female counterparts. There have been numerous suggestions as to why this is occurring in boys, but Whitmire suggests that one possible reason is that the expectations for reading readiness has increased, consisting of an increase in verbal skills, that boys are not developmentally ready to acquire. If boys have not acquired the essential literacy skills early on, the risk of falling behind can become permanent. He reports that a study done by Stanford University researchers found a connection between lagging reading skills and rising discipline problems. Whitmire states that the researchers concluded, “relatively low literacy achievement in first grade predicted relatively high aggressive behaviors in third grade” (p.33). Are we then to surmise that some of the behaviors observed in

class at certain block periods such as ELA may be to mask boys' fear, frustration and embarrassment of being found less competent or capable when it comes to reading and comprehension when attempting to engage them in different reading experiences?

Sokal et al. (2005) refer to boys as the “new disadvantaged in the school system” due to this increasing achievement gap. They state several reasons that research has shown could be the cause of this; such as, boys spending less time reading, having lower intrinsic motivation, and lower values in academic achievement. Sokal et al. (2005) also addressed the ideology that “masculinities affect boys' negotiations of schooling and their achievement” (p. 217), and point out that, “gender is a social construct and that not all boys exhibit these characteristics” (p.217). Even further than merely comparing boys to girls, Matthews and Kizzie and Rowley and Cortina (2010) point out that African-American and Latino boys have a more profound achievement gap than their White counterparts (p. 757). They propose that underachievement trends of African-Americans boys start early in the schooling process and could be caused by several factors including; the role of socioeconomic status (SES), interpersonal skills, home literacy environment and learning-related skills, which include social skills such as, task persistence, learning independence, flexible thinking, organization and attention control (p. 758-759). Dwarte (2014) studied the impact of single-sex education on African American reading achievement and also notes that 42 percent of African American boys have failed at least one grade level by the time they reach high school. She also states that nationally, less than 50 percent of African American males graduate from high school, and less than 8 percent earn college degrees (p.162).

The problem of the achievement gap is easily observed through results of numerous research studies and data, but what about solutions? Whitmire (2010) concludes that to date,

“the U.S. Department of Education has yet to fund a single study looking into boys falling behind” (p. 25). Other countries, such as Australia, are years ahead of the United States in addressing this “boy problem.” Although the U.S. Department of Education has not made the disconcerting issue a priority in determining viable solutions to remedy this matter, many states have taken it upon themselves to address this boy problem. One solution that has been studied in more detail in countries like Australia, but is currently being implemented and studied in the United States, is the proliferation of single-sex schooling and/or classrooms. Stotsky and Denny (2012) exclaim that, “gendered schooling is growing in the United States...but there has been little research at the elementary level to guide decision making on the usefulness of single-sex classrooms in public schools” (p. 439). Pahlke and Bigler and Patterson (2014) state, that approximately 1,000 U.S. public schools are now offering single-sex classes. Gurain and Stevens and Daniels (2009) have found that “public and independent schools are investigating the option of single-sex instruction to further support and improve the educational growth of boys and girls” (p. 235).

With many schools in other countries and now in the United States investigating the implication of single-sex classrooms as a way to strengthen the academic achievement of boys, the results of whether these types of classroom environments have been effective in raising the educational growth and scores of boys is important. However, there has been limited synthesis of the research on the effects of single-sex schooling. There is an overwhelming problem facing our schools today with the decrease in boys’ academic achievement overall. If single-sex instruction is a reliable and valid solution, is there enough reliable and valid evidence to prove its effectiveness or for that matter, its ineffectiveness?

Purpose

The purpose of my study was to explore what past and current research studies, in both the United States and neighboring nations, say concerning the implementation of single-sex classrooms and /or schools. The research studies were analyzed to address whether this approach is an effective strategy, and what factors positively or negatively impact the implementation of single-sex classrooms. A meta-analysis was used to synthesize the results of the research comparing single-sex classrooms and coeducational classrooms in regards to literacy performance and overall academic performance, as well as motivation, interests and attitudes of students, teachers, parents and educators as contributing factors influencing the success of single-sex classrooms.

As a result of this study, the following questions will be addressed:

- 1) What is the significance on the current situation facing schools today concerning the overall achievement of boys compared to their female counterparts?
- 2) What are the factors or variables that support the separation of boys and girls in the educational setting?
- 3) Are single-sex classrooms an effective strategy to increase achievement?
- 4) How do teachers' perceptions, attitudes and pedagogies affect the implementation of single-sex instruction?
- 5) What are students' perceptions related to single-sex schooling, and do student perceptions affect the success of such programs?
- 6) What other factors may significantly impact single-sex classrooms that need to be taken into consideration when determining its correlation to boys' achievement and motivation to learn?

Rationale

As a mother of two boys, the growing achievement gap occurring in the boy student population is of great concern to me as well as to the educational community. There is overwhelming evidence in the last decade from state, federal and national data that indicate boys are losing motivation to read and write and are academically performing lower than their female counterparts. Also, as a teacher, I have seen first-hand the different learning experiences and behaviors that boys present in the classroom in regards to engagement, attention and disrupting behaviors. Depending on the grade level, the behaviors exhibited can be taken as troubling and disruptive, if not handled appropriately. A solution that has been mentioned within the discussion of research is the implementation of single-sex classrooms. Much more research has been done in neighboring countries, regarding the implications of single-sex classrooms, and whether they are positively impacting boys' growth and achievement, specifically in literacy. Analyzing the research that has been done on this topic and determining if single-sex classrooms are an effective strategy in solving the problem concerning the academic achievement of boys in schools, will provide substantial information for parents, teachers and educators. My hope is that the indications of my research findings will shed some light on the controversy of whether implementing single-sex classrooms is an effective strategy and if so, what might be done to implement this in more schools. If not, what are some possible strategies that are effective in a single-sex classrooms that could possibly be implemented in a coeducational classroom to address the diverse needs and learning styles of the boys and girls, close the achievement gap and increase their chances of academic success?

Methodology

A meta-analysis was conducted in order to quantitatively and qualitatively analyze and synthesize the past and current studies involving single-sex classrooms versus coeducational classrooms. The meta-analysis was completed through the synthesis of results of studies done in the United States, as well as other westernized countries that have implemented single-sex classrooms. Pahlke and Hyde and Allison (2014) suggest that due to U.S federal regulations, single-sex settings are voluntary, so randomized designs may not be appropriated; therefore, selection of participants are taken into consideration. Other factors, such as sample size, socioeconomic status, class size, ethnicity, and teacher pedagogy and student perceptions are also taken into consideration and accounted for. Any and all factors were considered and accounted from the data collected on each research study analyzed. The criteria for selecting studies to be analyzed are as followed:

1. Contained quantitative and/or qualitative data on student outcomes.
2. Assessed K-12 classroom and/ or schools.
3. Provided quantitative data and significant qualitative data from interviews/surveys if pertaining to teachers' and students' perceptions and attitudes.
4. Provided data in which single-sex classrooms and coeducational classrooms were both involved in the data collections and comparison of results.

By providing quantitative and qualitative data concerning the research surrounding the efforts of single-sex classrooms, I hope to provide new insight and information that will aid in addressing whether single-sex classrooms are an effective strategy to decreasing the achievement gap in boys. The indications found within the research should be used to bring awareness of the potential biases and factors that influence the effectiveness of single-sex classrooms.

Chapter Two: Literature Review

Introduction

Within the last decade, there has been an overwhelming concern forming around the declining academic achievement of boy students. Sokal et al. (2005) characterize boys as the “new disadvantaged in the educational system” (p. 217). Data from state and federal levels have all pointed toward the increasing achievement gap evidenced between boys students compared to their female counterparts. This is occurring not only in low socio-economic and culturally diverse ethnic schools, but also among boys from college-educated families of high socioeconomic status (SES). Whitmire (2010) indicates that data from the National Assessment of Educational Progress (NAEP), showed that nearly 25 percent of White sons of college-educated parents scored “below basic” in reading achievement, compared to only 7 percent of their female counterparts.

Within the context of this significant gap, one strategy of particular interest being used to address the aforementioned pressing concern is the implementation of single-sex classroom instruction. This is occurring in both private and public schools around the world. According to Gurian and Stevens and Daniels (2009), in October 2006, the U.S. Department of Education made changes in Title IX regulations, expanding the opportunities for public schools to legally offer single-sex instruction as an option. Hayes and Pahlke and Bigler (2011) also discussed the easing of the restrictions on sex-segregated education, providing federal funding to become available for innovative education programs, including single-sex schools and programs within existing coeducational settings. The participation in single-sex programs must be voluntary, resulting in the non-existence of studies consisting of random selection of participants. This plays a role in the factors concluding the implications of single-sex instruction that will be

discussed further. Research on the effectiveness of single-sex classrooms has been increasing in the United States, yet is still years behind surrounding countries, including Australia, Great Britain and New Zealand (Hayes, Pahlke, & Bigler, 2011).

This literature review will begin to examine what the research reveals concerning single-sex classrooms. It will explore; (a) the significance on the current situation facing schools today concerning the overall achievement of boys compared to their female counterpart; (b) implications that support the separation of boys and girls in the educational setting including what the differences are between boys and girls; (c) the effectiveness of single-sex classrooms on increasing achievement and factors that may play a role in its effectiveness.

The Achievement Gap

Richard Whitmire (2010) spent a significant amount of time and effort investigating the increasing problem facing more and more schools today - that boys are slowly falling behind girls in all academic areas. In his book, *Why Boys Fail*, Whitmire discusses what Glenn McGee, professional educator and father of two boys, discovers after overseeing a research study conducted at Wilmette schools (situated along Chicago's high-income North Shore), where he was superintendent at the time. Glenn McGee joined other professionals in a task force to investigate if there indeed was a "boy problem" in their school districts. Many of the participants in this task force were also parents of boys, who began noticing changes in the motivation and interest in their boys to read, write and perform other academic activities. In 2006, the task force released a report that found "surprising gender gaps" (p.19). The study was conducted over a four year period and the findings concluded that; a) girls were 30 to 35 percent more likely to earn an A, overall; b) in grades five through eight, girls' grades were higher than boys' across

reading, writing, science, and math; c) girls outperformed boys across seven language arts scores on the Iowa Test of Basic Skills; d) seventy-one percent of the district's special education population was male; e) boys made up the majority of discipline referrals. In 2005, the Washington State data indicated that forty percent more boys than girls failed the state reading exam. In Massachusetts, an investigation discovered that forty-one percent of the state's girls scored proficient on the reading test, compared to twenty-nine percent of boys (Whitmire, 2010). After conclusive research, Whitmire suggests possible causes for the literacy lapses which include; a lack of phonics instruction in early grades, poor literacy education in lower grades and the dismissal of reading instruction in the upper grades, a lack of appropriate role models for boys, insufficient desirable text for boys, and the unrealistic expectations pushed on boys too soon.

Nicole Senn (2012) examined data concerning boys' reluctances involving literacies. She states that, "data suggests that boys around globe are struggling with literacy, especially when compared with girls at their same grade level" (p. 212). She also suggests that the data shows girls outperform boys on many standardized state tests in reading and "the underachievement of boys in writing is a major issue" (p. 212). Senn claims that a profound reason for this gap is motivation, and that "overall, boys devote less time to reading, tend to be less confident readers, have less motivation to engage in reading, do not value reading and have less interest in reading than girls" (p. 213).

Several researchers have examined the increasing achievement gap in boys and the effectiveness of solutions. While Stotksy and Denny (2012), explored the usefulness of single-sex classes in public schools for raising student achievement and boys' reading achievement, their study determined that "girls held a sizable performance advantage over boys across both

urban and suburban school districts and across all grade levels in both subjects, with the greatest gaps at the high school level” (p. 440). Matthews et al. (2010) examined the achievement gap in boys and the damaging effects it is having on African American boys. They discussed data from the Early Childhood Longitudinal Study-Kindergarten Study (ECLS-K), which revealed girls nationwide enter school with stronger literacy skills and show faster growth in literacy skills over the course of the first year of school. Matthews et al. also suggested that African American boys have an even greater risk for experiencing difficulties with reading and writing skills due to the influence of SES, stereotype threat, oppositional identity and cultural discontinuity (p. 757). They also state that the “general underachievement of African American boys in literacy has been documented in the *National Assessment of Educational Progress* (NCEP) in fourth, eighth and twelve grades, and other work has revealed similar trends” (p. 758). Dwarte (2014) concludes that “when it comes to African American males, the gender achievement gap adds complexities to an already troubling issue” (p. 164), and that they are subject to both racial disparities in academic achievement, as well as, gender-based gaps in school performance. Dwarte (2014) proposes that:

The differences in student performance between males and females span all racial and socioeconomic subgroups, have garnered national attention, and have prompted some to argue that there is now a boy crisis in American public schools (p. 164).

This underlying problem that boys are not performing as well as their female counterparts, regardless of SES, school type, and race is evident from numerous research and data. The increasing achievement gap has been investigated by a range of professionals and researchers, and the overall consensus is that boys are falling behind significantly and viable effective

solutions with measurable outcomes must be presented to address this problem.

“Boy will be Boys”

There are many theories as to why boys act and perform so vastly different than girls. A host of parents and educators will agree that boys can be much different than girls in relation to their behaviors and their approach to academics. So, what? Is the popular expression, “boys will be boys” enough of an explanation or otherwise, excuse? Is there a notably significant difference in how boys and girls perform in school that is affecting their educational performance and educational outcomes? It is apparent that the academic achievement of boys is in decline when compared to girls, and several strategies have been employed in an attempt to address the differences in gender, one being implementing single-sex classroom instruction.

Research implications tend to be controversial on the subject of whether boys and girls are actually “wired” differently, meaning that the brains’ of boys and girls develop and mature differently. However, there is no denying that many parents and teachers do notice significant differences in the ways boys and girls react to and handle situations. Nicole Senn (2012) discusses some of the following differences noticed between girls and boys that are often specific to age and grade level, some of them being inclusive of but not limited to:

1. In preschool and kindergarten, boys often express their emotions through actions, whereas girls use words to communicate.
2. Boys demonstrate a lesser degree of empathy and shorter attention span than girls of the same age.
3. In first through third grade, girls often read sooner and with greater skill than boys.
4. During first through third grade, children with attention and hyperactivity disorders are

usually diagnosed, in which 95% of students with hyperactivity are boys.

5. In fourth through sixth grade, boys generally focus on things related to action and exploration, whereas girls' attention is more focused on relationship and communication.

Gurian and Stevens (2004) explored the characteristics of boys' brains and suggest that they have more cortical areas dedicated to spatial-mechanical functioning, and on average use half the brain space that females use for verbal-emotive functioning. This makes “many boys want to move objects through space, like balls, model airplanes, or just their arms and legs. Most boys will experience words and feelings differently than girls do as well” (Gurian & Stevens, 2004, p.23). Furthermore, the findings of their research indicated that boys have less serotonin and oxytocin, the primary human bonding chemicals in their brain, than girls, making it more likely that they will be physically impulsive and less likely to be able to sit still and emphatically chat with a friend (p.23). In addition, they also argued that girls tend to multitask better than boys do, resulting in boys having more attention span problems and less ability to transition quickly between lessons due to their brains being structured to compartmentalize learning. Another characteristic of the male brain that can affect learning, which Gurian and Stevens (2004), explored is that, “the male brain is set to renew, recharge, and reorient itself by entering what neurologists call a rest state” (p. 23). Because of this, it is boys that will drift off before completing assignments, fall asleep during lectures and do things like, tapping their pencil and fidgeting, to stay alert; therefore, “the more words a teacher uses, instead of symbols, abstractions, pictures and objects moving through space, the more likely a boy is to ‘zone out’” (p.23).

Pahlke and Bigler and Patterson (2014) discussed another factor that is raised when

exploring gender differences by some proponents of single-sex classrooms - the high level of gender stereotyping within a coeducational classroom. Pahlke et al. (2014), also expound on this issue by stating that “social-psychological and “girl power” approaches highlight the negative effects of sexism in coeducational classrooms” (p. 1043), which support the claims of single-sex classroom proponents. They claim that in a coeducational classroom, boys tend to seek out and receive more attention, and that girls do not receive the support or gain the self-confidence they need, with the possible distractions boys may create. While Stoksy and Denny (2012), studied the implementation of single-sex classrooms in a public school, they suggest that “single-sex schools may have advantages for both boys and girls in terms of fostering socio-emotional health and promoting positive peer interactions” (p. 442). They also mention that efforts that were once created to promote female achievement may have exacerbated the discrepancy that now exists in boys’ achievement and stated the following:

The pedagogical techniques that teachers have been encouraged to use in reading, writing, and literature classes, and the changes that publishers were advised to make in reading and literature textbooks by education school faculty and others, often in the name of reducing gender stereotypes, were always in the direction of presumed girls’ needs and interests, not boys’, despite the fact that girls on average were always better readers and writers. (p. 444).

Several studies which addressed gender differences and the implementation of single-sex classrooms have indicated that teachers must be better informed and trained on specific differences that occur in boys and girls and how to address these differences in their instruction and classroom. Gray and Wilson (2006) conducted a study which examined teachers’ experiences with a single-sex initiative in a co-educational school setting. They mention a

previous study done by Gray and Leith, in 2004, addressing gender equity in the classroom which found that “teachers are aware of stereotypes in the classroom and, despite their lack of training in equity issues, where appropriate, attempt to challenge stereotyped behavior” (p. 287). In this study, teachers noted the role they played in perpetuating stereotypes by telling boys not to act ‘like big girls’ or to ask for ‘two strong boys to lift milk crates’ (Gray & Wilson, 2006). Stereotypes (and gender role assignment defined and promoted by society) have been created with decades of influence attached to them. How this is addressed in the classroom, may affect the achievement of boys and girls. Single-sex classrooms are a proposed solution in acknowledging these issues.

Academic Achievement

Single-sex classrooms have become an increasingly popular strategy when it comes to addressing the wide range of problems facing schools today. Whether it be a public or private single-sex school or a coeducational school offering single-sex classrooms as an option, this idea is not new to neighboring countries including, Australia, New Zealand and the UK, but has recently become more prominent in the United States. One of the rationales for implementation of this strategy is the increasing achievement gap among boys. Overwhelming research and data has shown that boys are falling behind girls academically in many subject areas, especially in reading and writing. Whether or not implementing single-sex classrooms is an effective strategy when addressing the academic achievement of boys is still up for debate and requires more research to be done. There are many factors that also play a role in its productiveness to increase achievement significantly.

Gurain et al. (2009), point out that although a single-sex classroom is not the only

successful way to teach boys and girls, it is an effective innovation to address gender equality and the achievement gains for both genders. They discuss several school districts that have implemented a single-school initiative and have had positive results. Woodland Avenue Elementary School in Deland, Florida began an opt-in experiment in single-sex instruction which provided professional training for teachers prior to implementation, that has shown measurable success with noticeable gains in both boys' and girls' progress, as well as less behavior referrals. Roosevelt Middle School, a public school in Oklahoma City, Oklahoma, with one hundred percent of students qualifying for free lunches and seventy five percent of the student population minorities, implemented single-sex classrooms in language arts, math and technology education and were able to narrow the achievement gap from 17 percent to 9 percent in one year. These are just two examples of many listed by Gurian et al. (2009), as they researched the success of single-sex instruction.

Stotsky and Denny (2012) claim that "little research exists on single-sex classes in public elementary schools" (p. 439); therefore, they set forth to find out if the use of single-sex class instruction significantly influenced boys' reading gains in two elementary schools. These findings were contingent on several factors, such as a limited sample size and no longitudinal data. Informal interviews were also administered and the information sought resulted in additional questions that could be examined more extensively in a larger study. However, quantitative data was collected through annual state assessment scores of literacy for both schools. The test scores were compared from the year prior to participating in single-sex classes to the year of participating. The results of the study show differences between schools but overall, "the trends in gain scores for boys and girls in literacy favored the single-sex classes" (p. 460). Moreover, a number of variables to explore in future studies were examined. Some of them

including; extended time in the single-sex classroom, the sex of the teacher, a more organized and departmentalized approach, and increasing professional development of the teachers.

Hoffman and Badgett and Parker (2008), also examined the effectiveness of single-sex instruction over a two-year period concerning achievement outcomes, as well as instructional practices, teacher efficacy, student behaviors, and classroom cultures as potential variables in an urban, at-risk high school. They concluded that although the majority of achievement measures favored a coeducational setting, there were numerous variables to consider that could have affected the outcome. The researchers claim that the use of grades as a measure of achievement may prevent true measure of growth, as there may be several factors influencing grade results, such as: a) course requirements, b) curriculum complexity, c) teacher style, and d) assessment criteria (Hoffman et al., 2008).

Dwarte (2014) studied the impact of single-sex education in public schools, with a distinct focus on African American students. Her study was intended to assess the impact of single-sex education on the reading achievement of African American males attending an urban middle school, located in the mid-Atlantic region of the United States and to determine whether restructuring from a coeducational school to a single-sex school would improve reading achievements for African American male students. The data from her study indicated that there was consistent increase in reading achievement during a 5-year span of analysis (Dwarte, 2014).

Research data is varied and proposes many outcomes and factors that play a role in determining the effectiveness of single-sex classroom instruction. Through my meta-analysis study, the indications of numerous research studies were examined and concluded in a thorough exploration of whether single-sex classrooms are an effective approach to increasing boys' achievement growth.

Chapter Three: Methods and Procedures

Positionality of Researcher

As a mother of two boys, the achievement gap that is evolving in the boy population is of great concern. It is so important to me, like many parents, that my children are receiving the best possible education. If there are strategies and different educational approaches that may increase the literacy involvement and academic achievement of boys specifically, then I want to be better informed of them. As well as, be able to share my knowledge and findings with other teachers and educators who may be struggling with approaching boys differently in the classroom. I am fortunate that my son, who is in first grade, is enjoying the reading process thus far and does well academically. He is interested in many genres of text, and engages in activities that promote his literacy on a daily basis, whether in school or home. My sons are exposed to a literacy rich environment, which includes being read to daily. My hope is that they never lose the desire and ambition to read and learn. For many children, especially boys, the motivation and interest in reading declines as they progress through school. They become disengaged, or it becomes too difficult for them; then learning and reading becomes a chore instead of an opportunity to grow and explore. The statistics that I have shared about the growing achievement gap are disturbing and are a real problem in need of real solutions with measurable results. There is not just one option and single-sex instruction is not going to solve all the problems, but *if* it is a viable option, than it should be considered and made available to more parents with children who are struggling. Through my research, I hope to shed light on single-sex instruction, and help to determine if it is an effective strategy in addressing boys' literacy and overall academic achievement.

Procedures

Following the basic stages and quality standards of a meta-analysis, presented by Dukes and Mallette (2010), my research was conducted as followed:

1. Formulated precise and relevant research questions.
2. Retrieved an unbiased, conclusive set of studies that follows the criteria mentioned above.
3. Used a reliable and concise coding system to constitute all variables and factors.
4. Analyzed the study results and characteristics and themes presented with the data.
5. Interpreted the outcomes, and discussed the results of my findings and indications of the research questions.

It is important that this meta-analysis provide thorough, statistical and analytical data. In order to do so, coding each study for its credibility, as well as, recording all possible factors that may influence the reliability of the effectiveness or ineffectiveness in the implementation of single-sex classrooms, was performed and discussed in great detail.

Data Analysis

A meta-analysis was conducted in order to analyze and synthesize the past and current studies involving single-sex classrooms versus coeducational classrooms. Research studies that have been conducted in both the United States and other westernized countries were included. The results of twelve studies were analyzed, following the specific criteria, in an attempt to answer whether single-sex classrooms are an effective strategy to increase boys' achievement, how teachers' perceptions, attitudes and pedagogies affect the implementation of single-sex instruction, how students' perceptions relate and effect the implementation of single-sex

classrooms, as well as other factors that may significantly impact single-sex classrooms effectiveness.

Criteria for Trustworthiness

I looked at various factors within in each research study to determine its reliability and validity. Within in each study, I looked for the following criteria to determine its trustworthiness:

1. Contained quantitative and qualitative data of student outcomes in both single-sex and coeducational settings.
2. Assessed K-12 classrooms and/ or schools, both private and/ or public.
3. Provided qualitative and quantitative data from interviews and/ or surveys if pertaining to educators' and students' perceptions and attitudes.
4. Provided data in which single-sex classrooms and coeducational classrooms were both involved in the data collection and a comparison of results were present.

Factors that were discussed within the research studies and taken into consideration, which are discussed within the meta-analysis are; (a) selection of participants, whether random or voluntary; (b) teacher perceptions; (c) socioeconomic status (SES); (d) class sample size; (e) ethnicity; (f) support and professional development of educators; (g) sex of teacher; (h) parameters of data collection.

Chapter Four: Findings

Although the studies provided sufficient data that allowed for reoccurring and common themes to appear with the various concepts and factors affecting single-sex classroom implementation, the results were inconclusive in answering whether single-sex classrooms are an effective strategy in addressing the academic achievement of boys. The findings are presented in relation to the underlying themes that appeared within the studies as well as factors that played a significant role in determining the correlation of single-sex classrooms with addressing the needs of the boy population.

Literacy Achievement and Overall Academic Growth

One of the most important questions to consider is whether or not single-sex classrooms are actually improving the achievement of boys and deemed an effective strategy, in regards to literacy and overall academic growth. Is implementing single-sex classrooms an effective way to address the predominant boy problem that is rising in the United States and other surrounding countries? Unfortunately, through the findings, this question cannot be answered with certainty. There are numerous factors presented that play a role in determining whether single-sex classrooms are actually supporting academic growth, or whether it is a combination of varying factors that play a role in its implications. As Pahlke, Hyde and Allison (2014) point out, after conducting an extensive meta-analysis on the effects of single-sex (SS) schooling compared to coeducational (CE) schooling on students' performances and attitudes, the reason for the research being so contradictory is due to methodological weakness. This is mainly because randomized assignment of students cannot occur within the United States, due to federal regulations stating single-sex classroom settings must be voluntary. Therefore, "much of the

existing research is not based on random assignment and confounds single-sex schooling effects with other factors such as the effects of religious values, financial privilege, selective administrations, small class size, or highly motivated teachers associated with the single-sex school being studied” (p. 1044).

Pahkle and Hyde and Allison (2014) examined 454 studies, and of those studies, they were able to analyze 184, which met their specific criteria for analysis. The studies analyzed were from the U.S. and internationally, and were coded as either controlled (higher quality, including controls for selection effects or random assignment) and uncontrolled (lower quality, no controls for selection effects, no random assignment). The four variables that moderated the magnitude of the effect size for differences between students in SS versus CE schooling were; dosage of SS instruction (class or school), student age (elementary, middle or high school), student SES, and student race/ethnicity (only examined among U.S. samples). Although Pahkle et al. (2014) investigated whether SS schooling had advantages over CE schooling in various domains, in regards to general academic achievement, there was a small advantage in SS versus CE schooling in boys, but only among uncontrolled studies. In the U.S. alone, no significant results could be determined among boys and only trivial advantages among girls. They supported their findings and counteract advocates for SS schooling by stating that there are not enough studies with adequate methods to prove advantages of single-sex schooling over coeducational schooling (p.1065). Although certain studies may not meet the criteria and quality for a controlled study according to Pahlke et al. (2014); it is pertinent, in order to attempt to learn more about single-sex classrooms and their perceived effectiveness, to note what other studies have found and concluded in regards to single-sex classrooms and the variables that contributed to the findings.

Stotsky and Denny (2012) sought to explore the usefulness of single-sex classrooms on boys' literacy growth, as they claimed little research has been done at the elementary level to guide decision making on whether single-sex classrooms helped raise boys' reading achievement. Their study was meant to be exploratory, as the sample size was limited and no longitudinal data was collected, and hoped to use the data to guide future research on this topic (p. 440). Stotsky and Denny (2012) explored two elementary schools (A & B), situated in a southern state of the U.S., in a grade 5 cohort (School A) and a grade 6 cohort (School B) involving two single-sex classes and one mixed class for one year. The study used the state's annual criterion-referenced tests (CRT), as well as, the literacy and language scores from a norm-referenced test (NRT) in school B, to analyze test data from the year prior to single-sex classroom implementation and data acquired during the year of. Although parents had the option to remove their children from the single-sex classrooms, both school principals claimed that did not happen. In School A, the boys in the single-sex class had a significantly greater increase in the Literacy CRT scores than the boys in the mixed class. In School B, although there were gains in boys' scores overall, there was no significant gain in boys' scores within the single-sex classes. Stotsky and Denny (2012) suggested that although the scores were differing among schools, the gain scores of boys in literacy did favor single-sex classes, and there was not an academic downside to experimenting with single-sex classes. Variables that the researchers indicated should be considered are: the time span for showing gains, teacher perceptions, organization of instruction, sex of teacher and professional development of teachers.

Hoffman and Badgett and Parker (2008) conducted a mixed-method evaluation in a large, urban high school in the Southwest with an at-risk student population to compare single-sex instruction (SSI) and coeducational instruction (CE) while attempting to answer these five

questions: (a) Are achievement scores for students participating in SSI greater than those for participants in traditional CE classroom instruction? (b) What was the influence of different teachers on the achievement of students grouped in SSI and CE classrooms? (c) What is the impact of SSI of teacher efficacy and satisfaction? (d) What are the opinions of teachers and students participating in SSI? (e) Are engagement levels greater in SSI classrooms than in mixed-sex classes? Data was collected over a two-year period comparing algebra and English course grades and standardized test scores of classes that consisted of same-sex students and classes that consisted of mixed-sex with similar characteristics taking the identical courses and assessments. In addition, teacher surveys, interviews, and classroom observations were performed to investigate teacher efficacy and satisfaction, levels of engagement, classroom behaviors, and student and teacher interactions. In regards to student performance, Hoffman et al. (2008) found that “the majority of achievement measures indicated superior performance in favor of CE grouping” (p. 25). They concluded that grouping students by sex does not, in itself, result in achievement gains, but rather their findings supported the notion that “achievement may be a result of the educational context, previous achievement differences, or other unmeasured variables (p. 25). Variables that they claimed may have affected the mixed results were: teacher consistency and effectiveness, course requirements, curriculum complexity and assessment criteria. The results of this study suggested that the correlation between single-sex classrooms and achievement cannot be determined due to the numerous variables that may contribute to the effectiveness of single-sex classrooms.

Marquis Dwarte (2014) evaluated to what extent the restructuring of a coeducational school to a single-sex school impacted reading achievement for African American students in eighth-grade attending an urban, middle school located in the mid-Atlantic region of the U.S.

Dwarte (2014) conducted a quantitative methodology using Analysis of Variance (ANOVA) to compare student performance in a coeducation school structure to each of the subsequent five years of a single-sex school structure. Reading achievement was measured by the score on the Pennsylvania System of School Assessment. Data results demonstrated a significant decrease in scores after the first year of restructure to single-sex schooling, favoring coeducational schooling in the first year. However, for the four remaining years, there was a steady increase in scores and by year 5 of the restructure, the mean score of the single-sex school was higher than the last reported score in the coeducational school. Dwarte (2014) concluded that although single-sex schooling was associated with a gradual increase in reading achievement, there is still a need for further investigation. She also recommended that qualitative methods are assessed to account for perceptions and experiences of students, parents, and the educators and that future studies focus on all school system types including rural, suburban and urban, as well as varying grade levels and subject areas. Again, a direct correlation between single-sex schooling and student achievement could not be determined without considering other variables.

In an effort to explore the effect single-sex configurations have on classroom environment, self-esteem, and standardized tests scores, Belcher and Frey and Yankeelov (2006) conducted an experimental, post-test-only design with sixth graders. Students were randomly assigned to either single-sex classrooms or a coeducational cohort, all experiencing the same teachers with parental consent. In regards to student achievement, test scores from the Commonwealth Accountability Testing System (CAT) were examined using a multivariate analysis of variance (MANOVA) comparing classroom type and gender. As hypothesized, there were no significant differences found between boys' test scores and classroom type. The experimental design and relatively small sample size was taken into effect when examining the

results, however it supported other researchers' concerns of the strength of such studies being done concerning this topic and the direct correlation between single-sex classrooms and student-achievement. Other aspects of this study will be discussed throughout analysis.

A direct correlation between single-sex classrooms and boys' academic achievement cannot be supported through the analysis of the studies discussed above. A number of the remaining studies focus on other variables that seek to determine whether or not single-sex classroom are effective.

Teachers' Perceptions, Pedagogy and Guidance

Reoccurring factors that are present within numerous studies concerning single-sex classrooms involve the teachers' implementation and instructional facilitation of single-sex classes. There are differing variables associated with teachers to be taken into consideration, but ultimately, they play an important role in determining the effectiveness of single-sex classrooms.

Gray and Wilson (2006) sought to evaluate the experiences of teachers in a post-primary school in Northern Ireland that had implemented single-sex classes. They claimed that "evidence suggests that teachers' attitudes to systems can either positively or negatively facilitate their implementation" (p. 289). Their evaluation took place after four years of single-sex classes being implemented within the school and consisted of a mixed-method of data collection, including questionnaires, one-to-one and small group interviews used to extend and enrich the results of the questionnaire. The questionnaire was designed "to gather information regarding teachers' perceptions of the introduction of the process, the training available to teachers taking single-sex classes and the impact of the single-sex class approach on pupil performance and behavior" (p. 288). In regards to training and support, 71 percent of teachers considered the training available

prior to implementation to be 'inadequate', 65 percent of teachers claimed that no additional training was offered after implementation. More than half of the teachers stated they would have liked additional support and three-quarters thought that the school did not provide teachers with good support. The results also indicated that 55 percent of teachers did not enjoy teaching boys-only classes, whereas 71 percent enjoyed teaching co-educational classes rather than single-sex. One teacher stated, "I would feel more confident if I was trained in strategies and methods to counter behaviors" (p. 296). Results suggested that the teachers did not feel that single-sex classes improved classroom behavior or that they raised academic performance, particularly among boys. In regards to boys' behavior, 77 percent of teachers thought that single-sex classes did not have a positive effect on boys' behavior and that it increased competition and bullying (Gray & Wilson, 2006). Several teachers believed that certain boys were more susceptible to bullying and that many boys were affected by a 'macho mind-set'. Overall, the results of the study conducted by Gray and Wilson (2006) identified the impact organizational factors have on teachers' attitudes to school-based strategies and the needs for preliminary and in-service training to equip teachers with the skills necessary to successfully implement new systems.

Frances Spielhagen (2011) claimed that the preparation of teachers is critical in the success of single-gender classes, as well as teacher's awareness of the differences in learning preferences between boys and girls. In order to contribute to his claims, he conducted a mixed-method study exploring the perspectives of middle school teachers who were hired to teach single-sex classes in southeastern U.S. In this specific district, the administrators had closed down a school that failed to meet the requirements of No Child Left Behind and created two single-sex academies in another part of the city. Spielhagen (2011) indicated that parents had the choice to opt their children out and other students could opt-in to the new schools, but the vast

majority of the student population came from the original, failing school. The study involved both quantitative and qualitative data collected in three phases. The first phase consisted of interviews with an initial group of teachers that were involved in a focus group. This group of teachers was formed by being the first hired for the new schools and by the professional development training already completed in the area. These teachers were considered the ‘teacher leaders’ and the key ideas that were identified during that focus group were used to drive the survey questions for the next two phases being used for all teachers involved in the single-sex schools. The second phase of data collection consisted of an initial survey administered at the beginning of the school year and the third phase included a follow-up survey administered at the end of the school year.

In the first phase with the focus group, two themes presented themselves. They were; initial optimism, and the need for administrative support. In this group of teachers “there appeared to be solidarity of purpose and belief in their joint endeavor” (Spielhagen, 2011, p.7). They also assumed they would continue to experience the support of their supervisors, but shared their concern with district administration. In phase two, involving the initial survey given one month into the school year; teachers expressed positive dispositions toward working in the single-sex school, while 88 percent of teachers responded that would need more professional development. A majority of the teachers felt that their students were more focused and that the single-sex classes would allow them to meet the specific needs of the students. For the third phase of the data collection, which was the follow up survey, 60 percent of the teachers completed it. The survey results reflected a decline in positive responses, and warranted a more detailed descriptive analysis of the survey responses. Six open-ended questions were added to the follow up survey that provided a more detailed perspective of the teachers’ experiences. From

the questions, two key themes were identified, which were; (1) the need for ongoing professional development and (2) the need for knowledgeable administrative support for varying teaching styles (Spielhagen, 2011, p. 10). From the beginning to end of the school year, the teachers in this study stressed the importance of professional development in order to discuss the strategies being implemented. Spielhagen (2011) suggests the teachers would have benefited from collaborative planning time for reflection and discussion about the implementation and effectiveness of strategies.

A study by Martino and Meyenn (2002) sought to investigate the impacts and effects of implementing single-sex classes as a strategy to enhance boys' participation and performance rates in English at a Catholic coeducational high school in Western Australia. Martino and Meyenn (2002) analyzed qualitative data collected by interviewing seven English teachers of single-sex classes in Year 8, which is the first year of high school at this particular school. According to the researchers, "the teachers' perspectives provided insight into the nature of the pedagogies deployed and the extent to which they were modified, given the single-sex context for teaching English" (p. 309). Several themes emerged through this analysis which were; (1) improved classroom learning environment and self-esteem for both boys and girls, (2) modification of pedagogy to reinforce gender stereotypical learning behaviors, (3) modification of curriculum content to accommodate boys' and girls' interests, and (4) enhanced curriculum decision making spaces to address specific gender issues for both boys and girls. Martino and Meyenn (2002) concluded that further examination of the specificities of teacher' pedagogical practices within the context of the implementation of single-sex classes is needed, along with implications for developing professional learning communities in schools based on enhancing teacher knowledge about the social construction of gender.

Martino and Mills and Lingard (2005) sought to address the impact of a range of influences on boys' experiences with single-sex schooling. Their research focused on a primary school in Australia implementing single-sex classes in Years 6 and 7, which are 10-12 year olds that was involved in a case study research project involving 19 additional schools in Australia. In this school, the teachers met as a team to determine which boys would be included in the single-sex classrooms for the following year, as they attempted to remove boys that were causing disciplinary or disruptive behaviors in the regular classrooms and put them in an environment that could address their needs. What concluded from conducting this study was a modification of pedagogy that occurred as both male and female teachers attempted to address specific beliefs and threshold knowledge they had on gender, which resulted from the boys' point of view, in a more engaging but less intellectually demanding curriculum. Martino et al. (2005) conclude that "any educational program and its implementation designed to address the educational needs of boys must be able to address the issue of teacher knowledges within the context of a model of pedagogies that is intellectually challenging, connected to the students' worlds, is conducted within a supportive framework and is cognizant of differences amongst boys and girls as well as between girls and boys" (p. 250). An additional discussion that should be noted about this study concerns the sex of the teachers and how it may have affected the implementation of the classes. The male teachers reported to have addressed the 'needs of the boys' more specifically than the female teachers. One male teacher referred to the breaks he gave his boys as "testosterone surge sessions" (p. 243). The boys reported to have drawn close relationships with the male teachers. On the other hand, the age of the teacher rather than the sex also played a role in the boys' perceptions of the teachers. As one boy stated, the teacher "joked around and understood them better" (p. 245) when referring to the younger female teacher. The

age and sex of teachers adds another component to the numerous factors affecting the implementation of single-sex classes.

Stotsky and Denny (2012) questioned the impact of the gender of teacher in relation to boys' academic achievement as they discussed further explorations concerning their research study that was discussed prior. They questioned whether the sex of the teacher would influence reading achievement and sociobehavioral issues in single-sex classes and whether a male teacher would have a greater impact on boys, specifically in reading. Sokal et al. (2005) also addressed the sex of reading models on boys in their study of sixty-nine grade 2 boys from four elementary schools in a Canadian urban center. One of the researchers' concern is that boys' lack of motivation to read may come from a perceived notion that it is a feminine activity due in part to the fact that most reading models are mothers, as well as, when entering daycare and school, teachers and reading models are predominantly female. The sex of the reading models in this study had both a positive and negative correlation to boys' interest in reading, therefore a significant correlation could not be found. As with many other studies, there was not a direct correlation that could be found to affect the motivation and effectiveness of boys' literacy and academic growth. The factors concerning single-sex classrooms are vast and need to be taken into careful consideration when determining the effectiveness of single-sex classrooms.

Student Attitudes and Involvement and Perception

When determining whether single-sex classrooms are an effective strategy in raising academic growth and development, the students' attitudes, involvement and perceptions must be taken into consideration as overlying factors that play a role. Like many other studies, the results rendered were both positive and negative, which add to the inconclusive correlation to be found

between single-sex classrooms and achievement.

While trying to address the debate of whether single-sex (SS) or coeducational (CE) settings are preferable, Shirley Yates (2011) conducted a study on boys' perceptions of their classroom learning environment over three consecutive years in a non-government school in South Australia. The aim of her study was to compare the boys' perceptions of the classroom learning environment before (T1), during (T2) and after (T3) the introduction of coeducational schooling into a single-sex boys' school. Four-hundred and ninety-five boys in grades 3-10 attending the SS school participated at T1 and were followed up over the next 2 years while coeducational schooling was introduced. The boys' perceptions were measured using an Individualized Classroom Environmental Questionnaire (ICEQ), which consist of 5 scales; personalization, participation, independence, investigation and differentiation. Yates (2011) states that the number of boys that participated in this study on all three occasions was considered to be adequate and relationships between T1, T2, and T3 were analyzed with repeated measures for each five scales. Also, the data was collected in the last term of the school year to ensure that the boys' perceptions were garnered over multiple lessons in the SS and CE contexts. The results from this study showed differing perceptions. The significant increase in boys' perception was found only for personalization and not the remaining scales once CE was introduced into the classroom. Yates (2011) affirms this with previous research stating that boys receive more academic attention and support from teachers in CE settings.

In addition to studying student achievement as discussed earlier, Belcher et al. (2006) sought to explore the classroom environment and self-esteem of sixth graders involved in single-sex classrooms. Instruments used in this study were the Classroom Environment Scale (CES) and the Hare Self-Esteem Scale (HSS), as well as A Mann-Whitney U test. The items in these

tests focused on involvement, affiliation, competition, order, organization, and innovation. Results from the CES showed significant differences, including students in the single-sex group perceiving their classmates to be more involved and believing their peers behaved more orderly and politely than in coeducational classrooms. In regards to self-esteem, students in single-sex classes had higher self-esteem related to school affiliation but no significant differences related to self-esteem with peer interactions.

Hoffman et al. (2008) reported on both attitudes towards single-sex instruction and classroom culture from their extensive study in a large, urban, at-risk high school. In regards to attitudes towards single-sex instruction, there were significantly negative responses as most students indicated that they preferred CE instruction over SS instruction. Hoffman et al. (2008) stated that more negative responses concerned the socialization aspect of SS instruction, as 66 percent of students indicated SS classes were not more fun and 71 percent of students disagreed that SS classes reduced disciplinary issues. More than 70 percent of the students did not prefer same-sex instruction. The researchers claimed that “the results of this nature are consistent with developmental views of adolescent behavior” and “that high-schooled aged children spent more than 50 percent of their time socializing with peers” (p. 26). This addressed another factor that the age of the students may greatly impact their attitude and involvement in single-sex classrooms.

In regards to classroom culture, Hoffman et al.’s (2008) results reveal a vastly different culture from SS classrooms to CE classes. There were more positive contributions to girls’ behavior, resulting in more collaboration, engagement, and encouragement. In contrast, the boys’ segregation prompted aggressiveness, competition, female objectification and male predominance. Martino and Meyenn (2002) noted that boys within SS classrooms that fail to

match the expectations of dominant, heterosexual masculinity are more at risk from the harassing behaviors of other boys. But on the contrary, they also discuss that single-sex environments afford boys more freedom to talk about issues related to their own embodied social practices of masculinity and that some teachers found that single-sex classes actually reduce the competitiveness amongst boys with the absence of girls.

The attitudes and perceptions of students involved in single-sex classrooms versus co-educational classes vary indifferently. Factors to consider including the age of the students, teacher pedagogy, willingness to participate, culture of the school, as well as the various ways single-sex classes are implemented. The implications and conclusions on this data analysis will be discussed as there are numerous factors to take into consideration when addressing the effectiveness of single-sex classrooms. Although this data only skims the surface of the controversial issues and research regarding single-sex classroom and its effectiveness, it provides a synopsis of the factors and implications that need to be considered when addressing single-sex classrooms as a strategy to increase boys' achievement.

Chapter Five: Conclusion

Just as I have attempted to shed light on the controversial topic of single-sex instruction, so have the research studies that I have discussed in this analysis. In an effort to fill in the gap in research, these studies have included varying methods and variables associated with single-sex classroom and its effectiveness. Unfortunately, research continues to be inconclusive and contradicting, as the underlining factors associated with single-sex classroom are numerous. In hopes of shedding light on the affect single-sex classrooms may have on boys' achievement, I found the research to be inconclusive and therefore could not find a direct correlation to single-sex classrooms and achievement without addressing many variables associated with it.

It is important to note, as Pahlke et al. (2014) discussed, the methodological weakness associated with many studies done within the United States. As mentioned, neighboring countries have been researching this subject for a longer period of time and do not have the regulation restrictions associated with implementing single-sex classes. Due to the fact that federal regulations in the U.S. state that same-gender classrooms must be voluntary, the use of random assignment cannot be done. This results in uncontrolled studies to occur, where variables such a selection of participants and sample size effect the outcomes. Although varying methodologies exist, it is still necessary to consider what current research has indicated in order to investigate the implications of single-sex classrooms and whether it is a viable strategy.

A prominent theme that exists and is discussed within many of the studies is the effect teacher pedagogy and knowledge has on the implementation of single-sex classrooms. Teachers' practices are dependent on many factors, including their own personal belief systems, their knowledge base of gender differences, curriculum requirements and training or professional development available to them. In several studies discussed, teachers felt unprepared and

unsupported with implementing single-sex classes. There was either a lack of training associated with the differing strategies in addressing boys and girls specifically, or the lack of professional development and collaboration in discussing and reflecting effective strategies and implementation. Just like with any other program, it is imperative that teachers feel prepared, supported and confident in implementing the program. If this does not take place, it will negatively impact the outcome of everyone involved. In addition to the preparation and professional development to teachers, another aspect to consider that will affect implementation, is the differing methods of instruction that will take place. This will be a result of differing values, beliefs and pedagogies of teachers. Unless each teacher will be implementing strategies in the exact same manner from a script, the variations of instruction will play a role in how single-sex classes are implemented. Another aspect in regards to teachers is the sex of a teacher implementing the single-sex classes. It has been considered that same gender teachers, for example male teachers with boy-only classes and female teachers with girl-only classes or vice versa change the dynamics of the classroom which will result in differing views and dominion and will affect the implementation of instruction within the class.

An aspect of single-sex classrooms that must be taken into consideration is the culture of the school involved. As with any school environment, the ethnicity and SES of students can greatly change the dynamics of a classroom resulting in differing attitudes, participation, expectations and most importantly, levels of knowledge. Just like with any instruction, single-sex classes will need to be adjusted according to the needs of the students. In addition to school environment, students' attitudes towards a program such a single-sex instruction must be taken into consideration. If a student is not willing to participant and has a negative views and attitudes about the classroom or vice versa, it will also affect the outcome.

Final Thoughts

Throughout this research, there have been valuable points made as well as questionable considerations. As discussed throughout this analysis, the fact that boys are falling behind in literacy and overall academically can be proven without question. Something needs to be done about that. Whether boys' brains are wired differently than girls can be debated, but this research and my own personal experiences can attest that boys and girls have contrasting approaches to learning and their environment. The ways in which a teacher instructs a child should always depend on their needs and interests. Whether boys' and girls' interests and needs are differing enough to warrant separate classrooms is definitely still up for debate. Although, a direct correlation between single-sex instruction and achievement could not be proven, it should not be dismissed as an option to be considered. However, the numerous variables associated with implementing single-sex classes should be considered. In most studies, no harm was done and small gains were made, therefore, single-sex instruction should continue to be an option worth exploring.

One thing I do know for sure is that I want my sons to never lose the desire and motivation to read and learn. This can be affected by teacher pedagogy, curriculum and approaches to learning in a classroom. Having a wide range of literacy components in a classroom that appeal to all the children's interests and needs will benefit a classroom regardless. A teacher that is in tune with the needs of their students and is a constant encourager and motivator will also benefit a classroom regardless. Although, the research studies discussed did not delve into specific strategies used within a single-sex classroom that might differ and be used within a coeducational classroom, this would be worth exploring as well. Could it be that teachers are given more support and professional development to address the differences

between boys and girls in a coeducational classroom, which would benefit both sexes without disturbing or constraining the other sex? Each individual student, whether boy or girl, possess unique characteristics and needs that will affect how they learn and how they engage within their environment. It is up to teachers and educators to be aware of the differences, so that the most effective learning is always taking place. Are there significant benefits to boys being enrolled in a single-sex classroom? I cannot say, as the research is inconclusive. However, I will continue to be an advocate for my boys, as well as for the boy students I come in contact with and strive to use the best practices and approaches that may increase their motivation, engagement and learning. The more teachers and educators are aware of the increasing boy problem facing our schools today, the more that can be done to decrease the achievement gap.

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