Bridging the Gender Gap in the Classroom

By

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BRIDGING THE GENDER GAP IN THE CLASSROOM

Abstract

This research paper focuses on providing an understanding of current perceptions of the gender achievement gap in the classroom and strategies used by classroom teachers to address the learning needs of struggling male students. For the purposes of this study, I conducted semi-structured interviews with two experienced classroom teachers in the Toronto District School Board to find out how they see the difference in academic performance between male and female students and the strategies they used to provide equitable teaching in the classroom. Interview data was categorized into four themes and analyzed with existing literature on this topic. Findings suggest that participants identify male students to be struggling in classroom subjects more than female students. Some possible sources of difference in performance are biological factors, such as maturity and hormones, and external factors, such as culture and gender stereotypes. In addition, I share practical examples and strategies of how teachers have attempted to bridge the gender gap in their classrooms.

Key words: Gender gap, strategies, academic performance, achievement
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Chapter 1
INTRODUCTION

1.0 Introduction to the Research Study

The relationship between gender and academic achievement has been a long-held concern in the education community. Historically, boys have been believed to be advantaged in classrooms in terms of grades and teacher preference (Weaver-Hightower, 2003). Research on gender equity in education highlight the difficulty and educational neglect many girls experience in the classroom. When the classroom is seen as more suited to male intellectual development, girls were “overlooked by teachers, recipients of biased pedagogy and testing, and dealing with poor academic self-concepts” (Matthews, Ponitz, & Morrison, 2009, p. 689). This worldview is prevalent in past research 1980s (Voyer & Voyer, 2014; Matthews, Ponitz, & Morrison, 2009; Weaver-Hightower, 2003) and unfortunately, is also prominent in current society. However, much recent research has shown that, aside from advanced mathematics and science courses, girls have narrowed, closed, or overcome many academic gaps in education that have previously favored boys (Matthews, Ponitz, & Morrison, 2009; Bursal, 2013; Voyer & Voyer, 2014). The tide of male advantage in academic achievement has begun to turn in recent years (Matthews, Ponitz, & Morrison, 2009). However, many years of societal bias against girls cannot be changed in an instant. These societal views still persist in classrooms, where teachers hold the success of their students in their hands. Aside from societal beliefs that boys outperform girls in school, the academic community is also in conflict. The literature on the science achievement of students report findings in favor of boys (Evans, Schweingruber, & Stevenson, 2002; Nosek, Smytha,
Srirama, Lindnera, Devosb, & Ayalave, 2009) while others report that there is no achievement gap in terms of gender (Matthews, Ponitz, & Morrison, 2009; Voyer & Voyer, 2014). Among the studies comparing the success of boys and girls in different subject areas, some conclude that boys perform better in areas like mathematics and science and girls perform significantly better in literacy and arts (Hedges & Nowell, 1995; Goldin, Katz, & Kuziemko, 2006; Spelke, 2005). However there are a growing number of studies that show no clear difference in performance amongst boys and girl (Matthews, Ponitz, & Morrison, 2009; Voyer & Voyer, 2014).

1.1 Research Problem

There is a disconnect between societal views and scholarly literature of academic achievements between the male and female sex, where the former holds onto the belief that boys significantly outperform girls in math and science despite the overwhelming evidence of the latter that there is little to no difference. Societal views are pervasive and can affect the worldview held by students, parents, and even teachers. While current research shows little significant gender gap in achievement, the attitude of female and male teachers differ when teaching their male or female students in the subject areas of math and science (Matthew, Ponitz, & Morrison, 2009; Bursal, 2013). I wish to investigate the social and psychological factors behind this difference, taking into account the nuances of socioeconomic status, race, background, age, etc. while focusing on North American classroom culture.
1.2 Purpose

In light of this problem, the goal of my research and my main research question is to learn how teachers, particularly elementary teachers, view the difference in academic achievement between males and females and what strategies they implement in the classroom to mitigate these differences. The topic is important to the education community in that the teachers’ views influence the strategies and actions that he/she takes in the classroom. This, in turn, affects the academic performance and achievement of the students.

1.3 Research Questions

1) How do a sample of elementary teachers perceive the relationship between gender and academic achievement?

2) What indicators do these teachers observe to support those assessments (i.e. grade, participation, engagement, etc.)?

3) In which subject areas do these teachers observe the greatest discrepancy between genders?

4) What factors do teachers attribute to the creation of this ‘gender gap’?

5) What strategies do teachers implement to respond to any perceived gender-based differences in academic achievement?

6) How can teachers challenge gender stereotypes concerning student academic achievement?
1.4 Background

As a female who specialized in the predominantly male subject area of science, I have been in classrooms where the teacher either favored or disfavored female students based on their intention to bring the girls up to the level of the boys or focusing on the boys because of the perspective that they would do better in the subject area, respectively. Regardless, the teachers bought in the view that boys were advantaged in science and math and girls were advantaged in literacy achievement and communication. I feel my experiences and background would color the perspective I take in the classroom. When I was in school, I excelled in all subject areas in elementary school but starting in middle school, my grades started to slip. I could not grasp math concepts as easily as I could before and my teachers made excuses for my failure by assuring me that this happened all the time. This view persists well into higher education and was even mentioned in teacher’s education a couple of times. My past experiences showed me that girls just weren’t as smart as boys and this was taken as a fact because it was repeated and internalized over and over throughout my education. However, academic research is on the other end of the spectrum, showing through experiments and data that there is little to no significant difference between boys and girls academic achievements. I am interested in studying this disconnect between proven scientific data and prevalent societal bias. I am interested in learning how I can better support my future student through inclusive instructional practices. Research shows that female and male students have little to no difference in academic achievements but societal norm persists in our actions and beliefs. Through my interviews, I strive to find successful and meaningful strategies that will not bias a particular gender but treat both fair and equal in terms of success.
1.5 Overview

To respond to the research questions, I conduct a qualitative research study using purposeful sampling to interview three primary school science teachers about their perspective concerning the difference in academic achievement between male and female students in the primary grades. Also, I look into their instructional strategies for meaningfully integrating one gender into a subject area that they are perceived to be disadvantaged in. In chapter one, I delve into my research questions. I expand on my background and reasons for interest in this topic. In chapter two, I review the literature on academic achievement difference between sexes in the years of primary school spanning from grade one to eight I concentrate mainly on literature in the science subject area as that is where I am most interested in. This research can help me in my interview with science teachers. Chapter three provides the research design, methodology, and procedure used in interviewing the three primary teachers participating in this study and the limitations encountered. In chapter four, I report my research findings with data that addresses the research questions. In chapter five, I discuss the insights and the significance of my findings in relation to the literature as well as possibilities for future studies. I also review the recommendations for my own practice as a beginning teacher.
Chapter 2

REVIEW OF LITERATURE

2.0 Introduction

Gender is a culturally-defined term that is often accompanied by stereotypes, biases, and socialization. The socialization process associated with gender has a continuous impact on the development of individuals to adulthood. Children as young as six-years-old are aware of their gender roles in society, in terms of clothing, behaviour, and speech (Matthews, Ponitz, & Morrison, 2009; Stephens, 2012). Researchers in the 1980s coined the term “chilly climate” to describe gender bias and discrimination against women in the academics (Mead, 2006; Matthews, Ponitz, & Morrison, 2009). The phrase “chilly climate” refers to the commonly held belief in the 1980s and even today that females experience bias and inequity during their schooling career, particularly in science, technology, and math (STEM) disciplines (Tatum, Schwartz, Schimmoeler, & Perry, 2013). In this chapter, I will review literature that shed light onto my topic of gender gap in educations. I plan to focus mainly on research conducted after 1980s to provide a modern view of the many facets of gender performance achievement in schools. Although I mainly concentrate on gender for research, it is not my intent to completely isolate gender equity from its inextricably tied relationship to factors of socioeconomic status, race, ethnicity, sexual orientation, family structure, age, etc.

For this literature review, first, I identify research regarding performance difference between the genders. The research looks at classroom grades, standardized tests, and teacher observations to shed light on the true performance difference between female and male students.
Next, I explain the controversial phenomenon of “Boy Crisis”, what it is, and how it came to be. Then, I explore various theories that attempt to explain the difference in academic performance between the genders. The topics I look at are self-regulation, writing and teacher perceptions, mother-daughter influence, priming and stereotyping gender norms, teacher’s attitude and gender influence, and controversial genetic connections. Lastly, I look at research from all-girl schools, whose scores are significantly higher than female students from co-ed schools. This section sheds light on how separating the genders and preventing female and male comparisons can affect the performance of female students.

2.1 Academic Achievement

There is a prevalent stereotypical view of men and women where males excel in math and science while females succeed in reading comprehension (Lindberg et al., 2010; Matthews, Ponitz, & Morrison, 2009). This view is supported by results in research literature. For example, Matthews, Ponitz, & Morrison (2009) agree with this view and assert that, in higher grades, girls’ performance is equal with boys’ performance except in advanced mathematics and science courses (Matthews, Ponitz, & Morrison, 2009). This could be due to the discerning fact that a smaller proportion of female students elect to take advanced math and science courses compared to their male counterparts. Fortunately, over the last several decades, female students’ interest, participation, and achievement levels in STEM (science, technology, engineering, and mathematics) have been on the rise (Estol, 2014). However, there is still a significant gender gap in education and the representation of females in specific areas of profession (Estol, 2014).
According to the 1995 Trends in International Mathematics and Science Study [TIMSS] report, fourth grade boys performed better in science than girls did in about half of the participant countries, while eighth grade boys performed better in science than girls did in most of the participant countries. These results showed that, as the grade level increased the science achievement gap between boys and girls increased in favour of boys. This study supports the stereotypic view of boys excelling in science for the year 1995. This trend continued in 1999 but the high science achievement level of boys disappeared in the 2003 study among 4th graders. After the 2007 TIMSS, it was reported that in some countries, including Turkey, girls outperformed boys (Martin, Mullis, Foy, Olson, Erberger, &Preuschoff, 2008). This turn in academic science achievement in favour of girls took place after 2007 on an international scale, showing a significant gender difference in performance between boys and girls in eighth grade (Martin et al, 2008).

Recent research by Silverman (2003) and many other researchers show that female students are achieving higher grades and widening the academic gap between male and female scores. Silverman explains that “girls tend to build stronger relationships with teachers, attain higher grades, achieve higher levels of education, and progress better scholastically overall than boys” (Silverman, 2003, p. 461). This raises questions as to whether female students are achieving better grades because of their own intelligence or because they tend to develop closer connections with teachers and thus receive more help. I will elaborate on my further research into this question later in this literature review in the other sections.
Voyer and Voyer (2014) also found evidence to support that females outperform males in academics. They found that female students have a stable advantage in school marks in most course subjects, including language, mathematics, and science. Looking at the gender gap in detail, they found there is a small but significant female advantage which appeared largest for language courses and smallest for mathematic courses (Voyer & Voyer, 2014). They disagree with Silverman’s explanation of stronger relationship to explain female academic success. Instead, Voyer and Voyer (2014) explain that school marks require effort and persistence over long periods of time. In fact, female advantage in school marks has remained stable across the years in the large amounts of data they analyzed, which ranged from 1914 to 2011. It is not a recent phenomenon that females have an advantage in school but that society does not see this advantage because of the prominence of male personnel in science, technology, and math domains (Voyer & Voyer, 2014).

Bursal also provided evidence of female advantage in science by showing that for both male and female students, their science grades decreased as grade level increased but female students had slightly higher success in science, which became statistically more significant as grade level increased (Bursal, 2013).

As we can see, research results tend to be inconsistent, some proposing that females are pulling ahead; others state that males continue to lead in science and mathematics courses, while others find no difference in academic achievement. This supports the fact that female and male students have a variety of learning preference and performance levels between and within their gender groups.
2.2 Boy Crisis – Are Male Students Struggling?

As noted above in the “Academic Achievement” section, research findings are still undecided as to which gender is struggling (Bursal, 2013; Voyer & Voyer, 2014; Silverman, 2003). However, researchers often mention the phrase “boy crisis” to refer to the observation that as female students succeed in academics, male students seem to be falling behind, contributing to a large gap in academic performance achievement that bodes ill for the success of boys in school and later in life (Mead, 2006; Matthews, Ponitz, & Morrison, 2009). On the other hand, many prominent researchers like Mead (2006) and Matthews, Ponitz, and Morrison (2009) say this is an exaggeration. There is only minor gender difference. Female students exhibit advantages in some academic domains but the gap tends to be small in most normative populations (i.e. middle-class). They emphasize that boys are not falling behind but that girls are doing better than ever (Mead, 2006; Matthews, Ponitz, & Morrison, 2009). In addition, Voyer and Voyer’s (2014) study looked at a variety of publications of evaluation of gender differences in teacher-assigned school marks in all stages of education. They took into account marks, nationality, race, gender, and year of publication. They found that boys are performing at the same level as before with minimal change while girls are succeeding more at school. Since these results came from an analysis spanning over 50 years of published research articles, they showed that the “boy crisis” is not a recent phenomenon, nor is it something to be concerned about (Voyer & Voyer, 2014). Girls are just doing better in performance achievement than boys. Female students are succeeding in school but this doesn’t mean that male students are struggling or lagging behind (Voyer & Voyer, 2014). However, this brings up the need for further research into how and
what we, as future educators, can do to help male students succeed academically just as much as female students.

### 2.3 Self-Regulation

Matthews, Ponitz, and Morrison (2009) propose that self-regulation has a large impact on the academic performance of female and male students. In their study, they looked at differences in self-regulation with respect to gender in the fall and spring of Kindergarten. They concentrated on gender difference in five areas of early achievement: applied problems (math), general knowledge, letter-word identifications, expressive vocabulary, and sound awareness. These five areas are meant to provide an indicator of academic performance in grade school later on. The researchers found that girls outperform boys in self-regulation to a significant degree (Matthews, Ponitz, & Morrison, 2009). This study on self-regulation in Kindergarten students is an indicator of success with performance achievement and academics in later grades, although this connection is subjective. In addition, the study relied on teacher reported self-regulatory behavior, which contains a margin of error and bias based on the preferences of the teacher and their opinion of what constitutes as self-regulatory behavior.

### 2.4 Writing and Teachers’ Perceptions

Peterson’s (1998) study showed that teachers’ perceptions were very important and provided a major source of bias and discrimination in the scores of students because it often
depended on the gender of the writer. In elementary and middle grades, scores for girls’ writings were consistently higher than on boys’ writing (Peterson, 1998). The teachers in the study often paid attention to male and female narrative writing characteristics and were able to deduce if a girl or a boy wrote the paper. A teacher who felt that a girl wrote the paper would score the paper significantly higher than teachers who identified the writer as a boy. The teachers in Peterson’s study (1998) defined gender related characteristics for boys include a limited offering of roles for female characters, positioning male characters in power, risk-filled roles that required independent problem-solving skills to overcome the obstacles, and violence and crime. On the other hand, feminine writing include less rigid style, positioning females in both powerful and powerless roles, the presence of some male characters, and resolving conflicts through the creation of alliances with others (Peterson, 1998). These preconceived notions of the gender of the writer are dangerous for the success of the students and perpetuates gender norms and stereotypes.

Peterson (2001) also looked at the teachers’ perception of gender in the writing of young students. She asserts that kids often find gender stereotypes and identities in how they write and the topic they choose. “Girls usually wrote about friends, family, pets, and personal experiences such as going to the mall, taking dance lessons, and breaking a leg by falling out of a tree, whereas boys usually wrote about sports, space, mythical creatures, adventures, and animals” (Peterson, 2001, p. 451). Students have social pressure to stay in roles and are very conscious of gender roles and barriers, which constrains their writing (Peterson, 2001). As future educators, we should rethink about classroom teaching and pay attention to our narratives by using them for social change.
Conversely, both male and female secondary and post-secondary teachers, prefer a “male style of writing”, as found by Roulis (Roulis, 1995, p. 154). Scores are higher for males who write with “dynamism quality (strong, aggressive, active, loud) and socio-intellectual status (literate, high social status, white collar)” while high scores for female writing for “aesthetic quality (nice, pleasant, beautiful, sweet)” (Roulis, 1995, p. 155). In addition, writing teachers suggest revisions for quality of writing for males while female revisions concentrate on word and sentence level. Roulis even went so far as to say, “Male teachers showed intolerance for emotional writing” (Roulis, 1995, p. 156).

These researchers showed that gender-related preferences often matched with a teacher’s scoring of student writing. This prominent bias, whether conscious or subconsciously from the teacher’s point of view, shows how much it can affect students’ academic achievement and how the instructor’s personal preference can create a gender gap in different levels of schooling.

2.5 Mother-Daughter Influence

Families have a large influence on the perception of academic success and competency amongst female students. Hall (2001) agrees with Eccles and Jacobs (1987) on the assertions that mothers of female students tend to believe that mathematics is a more difficult subject for their daughters compared to the mothers of male students. Often, adolescent students connect their own beliefs about their mathematical abilities to their mother’s beliefs about how difficult math will be for them (Eccles & Jacobs, 1987; Hall, 2001). Also, the relationship between female students’ belief and their mothers’ beliefs appears to be a stronger direct relationship than for
male students (Eccles & Jacobs, 1987). In addition to the connection between mother and
daughter, female students in high school report higher levels of mathematics test anxiety than
their male classmates (Eccles & Jacobs, 1987). This can be explained because of the anxiety the
mother’s feelings regarding the difficulty of math for their children (Eccles & Jacobs, 1987).
Eccles and Jacobs (1987) also asserts that female students will feel the effects of the social force
of their mothers' attitudes and beliefs because there is a stronger relationship between a mother's
beliefs and her daughter's self-perceived skills than for her son. The increased anxiety and social
pressure on female students can disrupt academic performance during math tests, thus creating
self-fulfilling expectations. Even though the study conducted by Eccles and Jacobs (1987) does
not explain the increasing mathematic performance amongst female students, it does offer
perspective into the influence of the mother’s expectations and beliefs of the daughter’s skill
with respect to her own skills in mathematics. Much like some students would say, “My mom
was bad at math, so I’m bad at math,” this cycle starts at home and brings attention to a
misconception of a genetic connection regarding math skills.

2.6 Priming and Stereotyping Gender Norms

Students are aware of gender norms from a very young age. In schools, priming or
mentioning gender norms can reinforce them. Students internalize these stereotypes and
unconsciously act them out (Matthews, Ponitz, & Morrison, 2009; Stephens, 2012). Stephens
(2012) referred to a study conducted by Spencer et al. (1997) where they showed that female
students under-performed compared to male students on a challenging Record Evaluation test
after being exposed to statements asserting that gender differences (favouring male students) were typical amongst test results. This shows that students internalized the gender differences and expectation. To obtain results without gender priming, a female-only version of this experiment was conducted. Spencer et al. (1997) placed the female participants in two distinct groups: an experimental group in which participants were primed with assertions of gender differences in test scores, and a control group in which there was no mention of any gender differences. Similar to the initial experiment, the students in the primed group performed worse on the test than their counterparts in the control group (Spencer et al, 1997). Additionally, Picho and Stephens (2012) assert that stereotypes negatively impacts female students across various cultural and geographic groups, and that it begins to affect girls at a very young age, as early as five years old. Negative stereotypes concerning girls’ mathematics ability are reinforced through differential treatment towards girls in society, at school and at home (Picho & Stephens, 2012). We can see this through the small percentage of women in science and math-related professions like engineering and low parental expectations of their daughters on mathematics-related tests and assignments that I go into detail on in the MOTHER-DAUGHTER INFLUENCE section. Sturman (2009) used her experience in the ‘Robot Show’ in Spring 2008 to show how male instructors of science or math courses don’t feel the need to promote their course to female students. “To him, it was a matter of personal choice, not systemic exclusion. Yet choice depends on social positioning and knowledge, not simply personal preferences” (Sturman, 2009, p. 1). In addition, she shares a valuable experience at a Microsoft women’s seminar:

I was amazed and appalled when, at an event attended by women computer scientists in advanced industry and academic positions, a gift package from Microsoft contained no
new software or technical toys (the standard gift at a male-attended technical conference) but simply makeup and chocolate. Some women gratefully accepted the gift, but a woman beside me quipped, “I guess this really shows you how they think.” I was not sure if she meant Microsoft, or the women, or both. Giving and receiving such a gift underlines the discursive reinscription of hyperfeminine norms for women in the computing field. (Sturman, 2009, p. 2-3)

This repetition and reinforcement of make-up and chocolates as opposed to technical items gifted to men at seminars is an example of how women are discriminated against in the workforce. This inequity starts in the classroom and girls become normalized to this behavior that they don’t take offense. Gender norms between males and females in classrooms often focus on behavior. Specifically, males are encouraged to develop self-concepts by which characteristics such as independence, leadership, and dominance are valued; females are encouraged to develop self concepts whereby value is placed on the ability to establish and maintain harmonious relationships with other people (Hall, 1997). These gender norms are reinforced and normalized so much that females tend to rate themselves higher than males for interpersonal qualities, moral goodness and virtue while males tend to rate themselves higher than females in dominating qualities such as leadership and persuasiveness (Hall, 1997).

Neuburger, Jansen, Heil, and Quaiser-Pohl (2012) mention the term “stereotype lift”, which is defined as “a performance boost that occurs when downward comparisons are made with a denigrated outgroup” (Neuburger et al, 2012, p. 62). Utilising a stereotype lift can benefit students in improving performance. On the other hand, stereotype threat has negative effects on
performance, which is most often the type of effect stereotypes have in society and in the classroom. In a study conducted by Neuburger et al (2012), the results indicate that gender effect in fourth grader’s academic performance was affected by both stereotype threat and stereotype lift. The students were informed that girls outperformed boys or that there was no gender difference, the results showed that the girls’ performance improved and the boys’ performance deteriorated. After a second round of tasks, performance levels stayed at about the same level (Neuburger et al, 2012).

As children grow up, gender norms become widely influenced through feedback from others and messages from media dictating appropriate behavior and opportunities. Children and adults are extremely sensitive to cultural stereotypes and values attached to masculinity and femininity (Hall, 1997).

2.7 Teachers’ Attitude and Gender Influence on Students’ Performance

Teachers have a large impact on students’ performance through the amount of time teachers and students spend together during school. Since teachers often mark assignments and assessment student progress, it makes sense that the attitude and gender of teachers also have an influence on student performance. Findings show that male teachers are more likely to teach with a more aggressive, disciplinary approach towards boys while both female and male teachers tend to ignore the disruptive behavior of boys more than that of girls if it’s not aggressive (Dee, 2006). In a study, Dee (2006) found that teacher gender significantly impacted academic performance. Girls perform better academically with female teachers while male students
perform better with male teachers. However, the data that was analyzed originated in 1988, which may be less applicable after over 20 years. Later research using more current research found no gender interactions between student and teacher genders (Dee, 2006; Cantrell & Sudweeks, 2009). In addition, students taught by male teachers had fairly constant test scores while students taught by female teachers saw improvements in their scores. Dee (2006) asserts that male teachers tend to be more supportive of male students but female teachers tend to be more supportive and expressive to all students and provide a more positive classroom overall than male teachers (Dee, 2006). On the other hand, Eccles and Jacobs (1987) suggested that teacher and student interactions vary according to the sex of the student where male students receive more attention, instruction, and assistance compared to female classmates (Eccles & Jacobs, 1987). Males and females are subjected to different learning atmospheres within the same classroom, even with the same teacher. According to Eccles and Jacobs, this provides a possible explanation as to why female students are discriminated against in the class. As these negative experiences within the learning environment continue and possibly increase, female students’ perceptions of academic abilities suffer, which can negatively influence opportunities in the future. Teachers may not intentionally treat females and male students different but they tend to passively reinforce gender stereotypes in the classroom (Eccles & Jacobs, 1987; Hall, 1997).

As future educators, we must strive to be “change agents”, which is a term used by Kewley (1999). The term emphasizes the influential role that teachers can and do play in and outside the classroom. Such decisions can include seating arrangements, what to hang on the walls, how to solicit answers from students, and what examples to use during instructions. If we
pay attention and be aware of what films to show and what readings to recommend, we can change these gender stereotypes that students bring into the classroom. Our beliefs can be reflected in how we praise, discipline, and respond to questions and issues arising around gender, race, sexuality, and other issues in society. There barriers like administration, faculty, fellow staff members, principals, and parents but teachers have autonomy to decide what to teach and how to teach it. Kewley (1999) gave an example of a group of teachers who went around the school and removed any material that had a mom in an apron and a dad with a briefcase. These small actions, such as taking down posters that reinforce gender norms, can create a welcoming and equal atmosphere for both genders.

2.8 Controversial Genetic Connection for Superior Male Math Ability

In addition to social factors that could affect academic performance between female and male students, some researchers, particularly originating before the 1980s, assert that there are also genetic differences between males and females. These genetic factors usually are in support of superior math ability in males (Benbow & Stanley, 1980). Hall (1997) references Benbow and Stanley (1980), who suggest that gender differences in mathematic performance can be explained on the basis of genetic underlying ability or a ‘superior male mathematical ability’. They used superior males’ performances on the Scholastic Aptitude Test for Mathematics (SAT-M) to support their conclusions. The sample included grades seven and eight students who took the SAT-M in the years from 1972-1979. They saw that there were consistently more males that scored above an arbitrary mean score than females, suggesting that males have superior
mathematical reasoning abilities. Benbow and Stanley stressed that the results were done with intellectually gifted adolescents and may not necessarily apply to the general adolescent population (Benbow & Stanley, 1980; Hall, 1997). As the researchers admitted themselves, the results were based on a highly selected sample and are not a true reflection of the overall student population. Later, other researchers looked into the overall SAT-M scores for the same time period of 1972-1979 and found that the results showed little difference in performance between the genders (Hall, 1997).

2.8.1 Spatial Visualization

The controversial ‘superior male’ theory also brings another research that follows on the same idea. Another popular biological interpretation proposed includes gender differences in visual spatial abilities (Eccles & Jacobs, 1986). Spatial visualization is “a skill that enables a person to mentally represent objects in multiple dimensions and in motion” (Eccles & Jacobs, 1986, p. 368). Spatial visualization is an important skill in science, physics, math and engineering; all of which are domains that boast a small proportion of females compared to males (Eccles & Jacobs, 1986). This suggests that males have superior visual spatial skills compared to females. Eccles and Jacobs (1986) proposes that visual spatial abilities are more advanced in males than females due to environmental factors. Males stereotypically have activities that revolve more around visual spatial tasks (i.e. puzzles, Lego, cars) while female activities which concentrate on care-giving and role-playing (Eccles & Jacobs, 1986). According to Eccles and Jacobs, if a child interacts mathematically and scientifically with play, he/she is more likely to seek out visually and spatially stimulating activities which would increase their
visual spatial skills, thus he/she would be at an advantage when faced with mathematical and scientific problem-solving exercises. This theory depends on gender normative of what is play is considered appropriate for girls and boys. This type of stereotyping has pervaded into today’s society through popular media, portraying to the general public that males have a ‘math gene’. Ironically, the perpetuation of these ‘scientific’ views by the mass media confirmed and strengthened parental gender stereotyped expectations (Hall, 1997).

2.9 All-Girls Schools

Much academic literature that discuss gender performance difference will often offer all-girls schools as a solution to what they believe is a ‘hostile’ learning environment for female students (Hembrow-Beach, 2011; Hall & Sandler, 1992; Lee & Bryk, 1986). For example, Hembrow-Beach (2011) asserts that the girls still face differential treatment due to their gender in co-educational classrooms. She acknowledges that in terms of gender performance, female students are improving and exceeding their male colleagues but “girls receive less and different attention from teachers than their male peers do.” (Hembrow-Beach, 2011, p. 3). She asserts that this is not the case in all-girls schools, where girls do not experience differential treatment based on gender because there is little to no gender discrimination amongst students. Hembrow-Beach (2011) states that all-girls learning environments provide more empowerment for female students than co-educational learning environments. Additionally, she asserts that the differential treatment experienced by girls in co-educational school settings causes them to fall behind in academic performance as well as in developing a healthy sense of self-esteem. Furthermore,
Hembrow-Beach (2011) reinforces what other researchers have already shown by stating that the problem of differential treatment based on gender appears to be most striking in mathematics and the sciences. She supports this by drawing on cross-cultural collection of research originating from Britain, US, and other countries that show that teachers tend to provide boys with more educational encouragement and direct teaching than girls, because boys are often seen as disruptive and off-task whereas girls are perceived to be diligent in the classroom (Hembrow-Beach, 2011). As a result, girls receive differential treatment resulting in less learning support and teacher attention than their male peers. Together, Hembrow-Beach shows that the differential treatment of girls by their male peers, parents, and teachers is shown to have detrimental effects on girls’ interest, participation, and achievement in non-traditional fields of study (Hembrow-Beach, 2011).

Hall and Sandler (1982) support Hembrow-Beach’s assertions that females suffer differential treatment in co-educational classrooms by purporting that the differential, yet often subtle, treatment of men and women in the classroom leads to lowered self-confidence and achievement for college women. The study refers back to the notion of “chilly climate” for female students and its negative impacts on women, which include decreases in cognitive growth during the first year of college (Hall & Sandler, 1982).

Hall (1997) has suggested that, in terms of academic opportunities, single-sex schools provide a more positive experience (especially for females) than co-education schools. Research indicates that all-girls schools provide more relaxed and academically centered environment for female students, who learn best in cooperative learning environments rather than competitive
settings where males perform better in. Male and female students have different learning styles, suggesting that classroom practices that enhance the performance for one gender would hinder achievement for the other (Hall, 1997). I feel there is a multitude of research that draws on gender norms and stereotypes. It must be noted that there is a great deal of variance in learning preference between and within gender groups. Although an all-girls school can cater towards the learning preference of the majority of girls, there must still be a variety of teaching styles to cater to the multiple intelligence in students.

Lee and Bryk (1986) support that all-girls schools enhance achievements of female students. In their study, female students reported more positive attitudes towards academic courses, including English and mathematics, participated in more mathematics courses, and spent more time on homework than males from all-boys school and female and male students in co-education schools (Lee & Bryk, 1986). This suggests that females in all-girls schools have increased achievement growth and advancement in science. Additionally, Lee and Bryk (1986) found less gender stereotypes and attitudes in all-female schools compared to co-education schools. Females are given opportunities to enhance leadership skills and take active roles in the classroom and around the school. Also, their research found that females from all-girls schools appear to possess more self-confidence and hold higher levels of aspiration than females from co-educational settings (Lee & Bryk, 1986). Research suggests that all-female schools better support academic and social development of female students compared to co-education schools (Hembrow-Beach, 2011; Hall & Sander, 1982; Hall, 1997; Lee & Bryk, 1986).
2.10 Conclusion

Above, I focus on various literature sources that elaborate on gender performance differences in the classroom and various factors that can affect achievement. It important that, as we read literature that pertains to gender, many literature will make natural assumptions regarding the best setting for female and male students. For example, it’s assumed that female students learn best in cooperative settings. This could have been supported by research but often, the researcher sees female students excelling in cooperative learning merely because that is mindset we are brought up in. Throughout this research process, I fought to keep a gender-neutral mind frame, free from gender norms but it’s been difficult and I find myself leaning on gender stereotypes to make sense of information. Nevertheless, it is important to be aware and shift away from the assumption that females are a homogenous group. We should recognize developmental and academic diversity amongst and between males and females. As future educators, there are strategies we can utilise to increase female and male confidence, participation, and interest in STEM. Sturman (2009) stresses that teachers often don’t bring awareness to the opportunities that are available to females in domains like science and engineering, often believing that “If they’re interested, they’ll come” (Sturman, 2009, p. 1). We can also emulate the welcoming, unbiased environment of girls-schools that push girls to succeed and shed gender norms and expectations (Lee & Bryk, 1986). Hall (1997) showed through his research that girls often fall into passive roles as male peers actively take control of group work or monopolize teacher’s attention. One strategy Hall (1997) suggests is to vary student roles by assigning assertive positions, like leader or presenter, to females and males. By alternating the position between male and female students, we can prevent girls from falling into passive roles.
This can also establish strong rapport and be supportive by modelling positive attitude. Above all, promote discussion, make learning meaningful, and engage students to spark their curiosity. These strategies can be used to make all students of all genders be more accepted and welcomed into their classroom environment.

For my research, I will bring classroom teachers into the conversation. I hope to build on the literature and findings by identifying the beliefs and perceptions amongst teachers. I will look into how teachers perceive the academic performance between the genders in the classroom and the strategies they implement to provide an equal and comfortable classroom for both male and female students. My research will add to the existing literature by examining the learning culture in co-ed schools for teachers that teach grades six to eight science and math. This can provide a good comparison with the data from all-girl schools to see how teachers can bring about the same environment into a class with male students.
Chapter 3
RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, I describe the research methodology I utilized to study the gender achievement gap in middle school students. I begin by reviewing the research approach and procedures and describing the data collection instruments. Then, I elaborate more specifically on participant sampling and recruitment. Afterwards, I explain my procedures for data analysis and review the ethical considerations pertinent to my study. Also, I identify both the methodological limitations and strengths of the research. Finally, I conclude this chapter with a brief summary of key methodological decisions and my rationale for these decisions given the research purpose and questions.

3.1 Research Approach and Procedures

This research study will be conducted using a qualitative research approach involving a literature review and semi-structured interviews with teachers. The decision of a qualitative versus a quantitative approach is not dependent on the researcher but more on the topic of study. As Marshall stated, quantitative is for answer the more mechanistic ‘what?’ questions while qualitative studies aim to “provide illumination and understanding of complex psychosocial issues and are most useful for answering humanistic ‘why?’ and ‘how?’ questions” (Marshall,
1996). For this topic of studying gender achievement gap in the classroom, I determined that a qualitative research would best provide insight into the current classroom atmosphere and also gather strategies and pedagogies that current teachers have utilized in their classroom currently.

Gender gap in academics is a controversial topic discussed in many circles of education and society so there is a great deal of research on the topic. I started this study by reviewing existing literature and continued to review literature through the course of this research. I also referenced literature provided in my courses Curriculum and Teaching in Literacy, Mathematics, and Reflective Teaching and Research in Education in the Master of Teaching program at OISE, University of Toronto. In addition, I consulted the Ontario Ministry of Education documents on mathematics and literacy to determine the academic achievement levels for intermediate students. These sources were helpful for me to begin to delve into more academic, peer-reviewed sources. The articles I chose to research and reference are current or former researchers who have educational backgrounds. Some examples of well-known researchers in this area that I have referred to in the process of this study are Linda R. Hall, Shelley Peterson, and Mead. As prominent figures in the field, they often include case studies of qualitative research interviews to enhance their position (Creswell, 2007). As such, I have done the same by using qualitative, semi-structured interviews to build the foundation of this study. As the study progressed, I continued to refine and revise my literature review using academic journals, course materials, and my interviews.

This study is a qualitative research study. My data are based on interviews (see Appendix B) with experienced teachers who have witnessed the gender gap in academics and implemented
strategies to forge this gap. To gather information about effective practices and strategies to mediate the gender gap in classrooms, interviews are the most effective way to collect qualitative data (Creswell, 2007). I conducted semi-structured interviews with two experienced teachers. The interviews consisted of four sections. I started the interview by finding out about the teachers’ background experiences and ascertaining if the teacher fit the criteria I set for participants. Secondly, I asked about attitudes, practices, and strategies for engaging students in mathematics and literacy. I also focused on the why and barriers that were preventing boys from succeeding as much as girls in mathematics and literacy. I concluded with looking at the teachers’ next steps for developing additional strategies, limitations, and additional details concerning the gender gap that they’ve witnessed.

3.2 Instruments of Data Collection

The instruments of data collection I used for this study is my semi-structured interview protocol (see Appendix B). Semi-structured interviews provide the opportunity to hear about participants’ experiences in great details compared to other data collection types like surveys and observations (Creswell, 2007). There are also unstructured and structured interviews. Very little interviews are unstructured but they start with observation and field experiences. Structured interviews are the exact opposite with research-prepared questions and strict protocols to follow the question and script (Creswell, 2007; DiCicco-Bloom & Crabtree, 2006). Semi-structured interviews are the sole data for this qualitative research project. The interviews were scheduled in advance at a designated time and location after school. The questions are open-ended with
new questions emerging depending on the dialogue and conversation in case new information and nuances become apparent during the interview. This protocol follows the general protocol for semi-structured interviews (Creswell, 2007, DiCicco-Bloom & Crabtree, 2006).

My semi-structured interview protocol is appropriate for this research purpose and my research questions. This format allows the interviewer to design and plan an interview that concentrates on research focus and questions while leaving room for participants to elaborate and even re-direct attention to areas previously unforeseen by the interviewer. Hidden nuances can be identified and fully explored with elaborate details because semi-structured interviews allow changes in questions during the interview. (Creswell, 2007; DiCicco-Bloom & Crabtree, 2006).

3.3 Participants

Here I review the sampling criteria I established for the teachers participating in my study. I review a range of avenues I took for teacher recruitment. I also introduce each of the participants and their backgrounds.

3.3.1 Sampling Criteria

The participants were chosen based on the following criteria:

Teachers will have a minimum of five years of experience teaching in a classroom. This provides more experience in teaching and more interaction with students. As classrooms change due to social and demographic factors, achievement between genders also change. I am interested in learning the teachers’ perspectives on the changing classroom environment.
Teachers will have taught in a public school with both boys and girls in their classroom. Often, most research pertaining to gender achievement gap stems from private schools or single-sex schools (Estol, 2014). I am interested in what teachers who work in publically funded schools with mixed sex students do to combat the difference in achievement in their classroom.

Teachers are aware of the gender achievement gap through witnessing it firsthand in their classroom. As this is the topic of this study, participants have witnessed many times the gender achievement gap in their classroom. This shows the teacher is experienced and acknowledges the classroom climate. Teachers also are reflective of their own teaching strategies and pedagogy to accommodate the struggling gender.

Teachers were implementing strategies to address the problem of poor academic achievement amongst girls and boys in their classes. This demonstrate leadership in gender equality and proactive signs of care and compassion to help all students achieve. Participants are also able to offer strategies and pedagogies to beginning teachers to reduce the achievement gap in future classrooms.

3.3.2 Sampling Procedures

There are different forms of sampling such as purposeful and convenience sampling. Purposeful sampling refers to the active selection of the most productive sample to answer the research question. This type of sampling can also be known as judgement sample and is the most common sampling technique (Creswell, 2007; Marshall, 1996). Convenience sampling refers to the selection of the most accessible subjects. This type of sampling is the least costly to the research, in terms of time, effort, and money. However, the downside to convenience sampling is
poor quality in data due to bias and less credibility (Creswell, 2007; Marshall, 1996). For this study, I conducted purposeful sampling to locate my participants. As Marshall stated, “qualitative researchers recognize that some informants are ‘richer’ than others and that these people are more likely to provide insight and understanding for the researcher” (Marshall, 1996). The participants I have chosen fulfill the criteria that I have set. I believe their experiences, background, and pedagogy make them ‘richer’ than others and can provide detailed information and insight into this research.

I located my participants according to the criteria given earlier. I contacted school boards and principals and provide them with an abstract of my research study. I also provided the criteria for my participants and asked these individuals to distribute my information to teachers they believe may fulfill the criteria. This could be a potential ethical issue for teachers who do not want to give out information. Therefore, I provided them with my information and to contact me if they feel comfortable participating in the study. This helped ensure that teachers are volunteering to participate rather than feeling pressure or obligation to participate. Also, I asked them to contact possible teachers in advance to ensure they fulfill the criteria I set for my participants.

At the same time, my study also relies on convenience, which can make my sampling convenience sampling as well. I hope to rely on existing contacts and networks in my colleagues and teachers to recruit participants.
3.3.3 PARTICIPANT BIOS

I identify my first research participant under the pseudonym Alan. He is a grade six homeroom teacher who has approximately 15 years of teaching experience. For all of those years, Alan has taught in the position and school he is in today. He has taught all subjects aside from French, Dance, and Music. He mainly teaches grades four to six, with emphasis on Physical Education, Math, Science, and Literacy. The school demographics is predominantly first-generation Canadians. The majority of the students are born in Canada and is fluent in a language other than English or French. The community is mainly a low to mid-socioeconomic class.

My second interview participant is Amy. Amy is a grade eight homeroom teacher who has more than 15 years of teaching classroom experience. Aside from the first year, Amy has taught in the position and school she is in today. She teaches History and Geography, Literacy/English, Science, Health, and Math. The school demographics is predominantly Caucasian with a high socioeconomic level.

3.4 Data Analysis

Data analysis is an important and crucial stage in any research study. Often, qualitative data analysis and data collection occur concurrently so researchers can generate additional questions to gain more insight and understanding of themes or categories that emerged during the interview. This is referred to as saturation (DiCicco-Bloom & Crabtree, 2006). I attempted to do this during my interviews. After much literature reviews, I gathered as much information about
possible themes and categories. I prepared to think up new questions for participants to expand and fully explain themes and categories that come up during the interview.

After I collected the information from the interviews with my participants, I carefully transcribed the interviews. I coded the transcripts using my research questions as an interpretive tool. The transcripts were coded individually. I looked at categories of data (e.g. strategies, pedagogy) and themes within the transcripts. I identified common themes and differences in the data and considered relevance to the research questions.

I then compiled similar categories and themes together and analyzed them by comparing them to existing literature. Through this, I was able to delve further into research and create more meaning from the ideas in the interviews.

I will also be looking at “null data”, which is any topic or theme that my participants did not speak to. I develop this further and explain the significance later in this study.

3.5 Ethical Review Procedures

Participants were given letters of consent prior to the interview process, giving their consent to be interviewed and audio-recorded. The letter provides an overview of the study, addresses ethical implications, and specifies the expectations of participation, which informs participants that they agree to participant in a semi-structured interview of 45 to 60 minutes long. The letter also covers confidentiality and consent, right to withdraw, risks of participation, member checks, and data storage. These issues are important to not only protect the interviewees
and their opinions but give freedom of speech during the interviews (Creswell 2007). The interviewees read and signed the consent form before the interview (see Appendix A). A copy was given to the participant and another copy was kept for the publication of this study. Participants were also informed about the content of the study. Confidentiality was kept to ensure the comfort and truthfulness of the participants in the interview. All information concerning participants are kept anonymous and confidential. Any identification has been done with the use of pseudonyms for individuals and institutions. Participants were assigned a pseudonym and any identifying markers related to schools, students, or positions will be excluded.

Following the procedures of consent, I informed the participants that they can refrain from commenting on any question and stop the interview at any point. They were notified of their right to withdraw from the participation in the study at any stage of the research study. All procedures were conducted as specified in the consent forms signed prior to the interviews. No changes were made to those procedures during the course of the research process.

There are no known risks to participation in this study.

After the interview, participants had the opportunity to review the transcripts and to clarify or retract any statements before I conduct data analysis. This further gave participants control over what will be analyzed and published.

All data, including audio recording and transcripts, were stored on my password protected computer and will be destroyed after five years.
3.6 Methodological Limitations and Strengths

I am aware that my study has several strengths and limitations.

First, the ethical parameters for this study limits the scope of the study regarding participants. The sample size only consists of two interviewees, which is small. Many studies require a large sample size to reduce bias. However, since the purpose of this study is to examine exemplary practices that can help shape my personal pedagogy, the sample size seemed reasonable. As Marshall stated, “qualitative researchers recognize that some informants are ‘richer’ than others and that these people are more likely to provide insight and understanding for the researcher” (Marshall, 1996). The participants I have chosen fulfill the criteria that I have set. I believe their experiences, background, and pedagogy make them ‘richer’ than others and can provide detailed information and insight into this research. Other participants like student and parents could provide more insight into my topic. Also, other ways of data collection like classroom observation and surveys could broaden the scope of my research. These varied participants and data collection methods would not only decrease bias but also provide insight into hidden nuances that two teachers might not notice or acknowledge (Creswell 2007). It’s important to acknowledge that semi-structured interviews with two practicing public school teachers can provide more information about the study but they do not generalize the experience or knowledge of teachers more broadly speaking.

On the other hand, the strength of conducting semi-structured interviews is the depth and quality information that can be obtained from a one-on-one interview process compared to a survey. The communication and social aspect of the interview allows the participants to elaborate
and focus on topics of importance. Semi-structure interviews provide a safe space for teachers to speak on matters that matter most to them. It validates teachers’ voices and experience and makes their lived experiences meaningful. The process of interviewing allows teachers to reflect on their practices and to articulate how they conceptualize their strategy and pedagogy concerning this topic.

My research questions were limited in scope. I had a set number of questions I could ask that I felt would help me learn the most for my study. Regardless, I felt that I learned many new strategies and information from my interviews that would help in future research. The questions I asked were picked carefully to maximize the quality of information I hoped to receive. They also served to help teachers efficiently articulate their strategy, thoughts, and pedagogy regarding the topic of the questions.

Lastly, my literature review was limited. Achievement gap in gender is such a broad field that I could not cover all perspectives in the scope of this study. I chose to focus on key researchers and attempt to cover key perspectives on my topic. I carefully chose the articles and books that were relevant to my topic of gender achievement gap in mathematics and literacy. As such, the articles I have chosen are on-topic and include only the most relevant research pertaining to my topic.
3.7 Conclusion

To conclude, in this chapter, I described the research methodology I utilized to study the gender achievement gap in middle school students. I began by reviewing the research approach and procedures and describing the data collection instruments. Then, I elaborated more specifically on participant sampling and recruitment. Afterwards, I explained my procedures for data analysis and reviewed the ethical considerations pertinent to my study. Also, I identified both the methodological limitations and strengths of the research. Finally, I concluded this chapter with a brief summary of key methodological decisions and my rationale for these decisions given the research purpose and questions.

Next, in chapter four, I report the research findings.
Chapter 4

FINDINGS

4.0 Introduction

In this chapter I report and discuss the research findings, which were generated from the two interviews I conducted with experienced, practicing teachers in the Toronto District School Board (TDSB). I share the teachers’ thoughts, ideas, and observations and identify emergent themes and sub-themes across all data as they relate to the perceived achievement gap between boys and girls. My research questions seek to provide an understanding of current perceptions of the gender achievement gap in the classroom and strategies put in place to address the learning needs of male and female students. Following data analysis, I identified the following themes from the data, which I report and discuss with reference to current literature. My themes explore how: 1) Teachers identify that male students are struggling in subjects using assessments results from classroom evaluations, standardized tests such as the EQAO, and classroom observations, 2) Teachers attribute the gender achievement gap in their classroom to biological factors, such as maturity, hormones, brain development, and learning styles, 3) Teachers observed that external factors, such as school and community culture, socioeconomic levels, perceptions of parents and students, and teacher teaching practices reinforce traditional gender norms and stereotypes, and 4) Tips and strategies that teachers use to assist male struggling students. Under each heading I report sub-themes with relevant data from interviews with my participants in light of current literature. In addition, I share practical examples and strategies of how teachers have attempted to bridge the gender gap in their classrooms. Included in this chapter are direct quotations from
the research participants and current literature that fully establish the connection between theoretical and practical frameworks regarding gender achievement gap in the classroom.

4.1 Teachers Identify Superior Performance Among Female Students But To Different Degrees

My interview participants shared many aspects like teaching experience and school board but their differences provided me with information for a study of gender achievement difference over grade levels.

Both participants agreed that female students are succeeding academically compared to their male peers. This is in accordance with the majority of current literature. For example, Voyer and Voyer (2014) provide evidence that support female advantage in academics. They found that female students have a stable advantage in school marks in most course subjects, including language, mathematics, and science. Looking at the gender gap in detail, they found there is a small but significant female advantage which appeared largest for language courses and smallest for mathematic courses (Voyer & Voyer, 2014). Instead, Voyer and Voyer (2014) explain that school marks require effort and persistence over long periods of time. In fact, female advantage in school marks has remained stable across the years in the large amounts of data they analyzed, which ranged from 1914 to 2011 (Voyer & Voyer, 2014). This shows that female students appear to be achieving academically more than male students. This was also seen by Alan’s observations that female scores on the EQAO were above their male counterpart’s scores across all subjects. This also supports Amy’s observations that females are succeeding more than males.
Alan acknowledges the gender gap and suggested that it is a large issue, especially in elementary education because students are arriving and beginning their educational career with this gender gap prevalent in classrooms already. Amy observed that the gender gap is not very prevalent and will narrow in high school.

A possible source of diversion between the two teachers is their data collection. Alan draws on data from the EQAO tests. He is a grade five and six teacher so he has access to years upon years of EQAO data, which often details the strengths and weaknesses of every student in the class. In addition, EQAO also releases reports of the class averages based on gender. Alan also leads Professional Development with other junior teachers to discuss EQAO scores and future steps. Amy is a grade eight teacher so she does not have EQAO scores to draw on. Rather, she refers to her observation notes and close relationship with students and parents. It’s interesting to see the difference between standardized tests and in-class observations. Standardized tests like the EQAO show clearly that girls outperform the boys in “the reading and writing and math of the EQAO tests but […] Social Studies and Science as well. The EQAO really shows the gender gap that girls outperform the boys across all subjects” (Alan). On the other hand, based on her in-class observations, Amy sees the gap closing.

No I would say the gap closes. I would say that the gap exists at the beginning, developmentally. It’s the developmental continuum. Kids don’t acquire language at the same rate. So you consider the developmental child to be a range of ability in the primary years and then I would say you run into issues of one gender maturing more quickly in some years than the other. And so I would say there’s a leveling off point in high school
where the field is leveled and I would say it has more to do with actual maturity than it does with academic capability (Amy, 2015).

It’s interesting to see that data drawn from different sources can give such a startling difference in the achievement of boys and girls. One possible explanation is the generalization of standardized tests. Standardized tests like the EQAO often have many negative points to be taken into consideration, like cultural biases and generalization of students regardless of location, background, socioeconomic levels. It would be an interesting next step to look at standardized tests compared to class observations to see how much they differ.

4.2 Participants Explained Gender Gap in Terms of Biological Factors

There is a prevalent stereotypical view of men and women where males excel in math and science while females succeed in reading comprehension (Lindberg et al, 2010; Matthews, Ponitz, & Morrison, 2009). However, this is not what we see in classrooms. My interview participants confessed that they bought into this misconception before they started teaching and realized early on that the true achievement gap was very different: girls have a greater academic success across all subjects compared to the boys. From their experiences, the advantage that girls have over boys in academic achievement has many different possible explanations.

4.2.1 Maturity and Hormones

Both of my research participants referred to the development and maturity of students as the main reason for the gender gap. The difference in grades between them, one which is an elementary teacher, the other a middle school teacher, place more emphasis on the difference in
development for the students. For a grade five teacher, Alan attributes the gap to hormones and restlessness. Male students are more restless and this negatively affects their class performance. On the other hand, Amy, whose students are grade seven and eight and are at the turning point of puberty, the issue is maturity.

So I would say, typically, when you’re dealing with 14 or 15 year olds, girls tend to be further along the maturity continuum in their ability to perform. I would say boys have a more difficult time at this age because the gap between the boys and the girls is more prominent. Boys have yet to begin or finish puberty. Girls are often mid to through it. You can see that kids with learning disabilities in younger boys, maturity is often the most key piece. Which is something you cannot change. You can teach them whatever you want to teach them but you can’t force them to mature until they are physically and mentally ready. (Amy, 2015)

Through this, it’s obvious to see that gender difference in classroom is mostly attributed to development of the students. Both teachers identified that certain biological differences between boys and girls are responsible for the gender gap in classrooms.

**4.2.2. Physical Differences, Concentration, and Brain Theory**

Another theme that emerged from the interviews is the idea that physically, boys and girls are different in terms of activity and control over the body. As Alan says, “boys tend to be more sufficient in gross motor, physical activity, sports whereas girls are more advanced in fine motor, writing, writing with a pencil, sitting down, concentrating” (Alan). Explanations of male superiority in math were supported by Benbow and Stanley (1980) that male achievement could
be due to genes. Benbow and Stanley (1980) argued that genetic factors underlie superior math ability in males. In addition, Hall (1997) references Benbow and Stanley (1980), who suggest that gender differences in mathematic performance can be explained on the basis of genetic underlying ability or a superior male mathematical ability. Although the claim was controversial, it supported conventional thinking of the time and reinforced society’s views that males excel in math and science while females succeed in reading comprehension (Lindberg et al, 2010; Matthews, Ponitz, & Morrison, 2009). Although the research was controversial, the mentality still continues in society that there is a physical, biological difference between girls and boys that allow one gender to succeed over the other.

Concentration and learning style are often interconnected and defined biologically. Learning strategies are influenced by factors such as understanding, preference, and the types of coping mechanism the student falls back on. This, in turn, influences student achievement in school. For example, literacy is an area where, on average, female achievement is greater than that of their male peers (Lindberg et al, 2010; Matthews, Ponitz, & Morrison, 2009). This is also prevalent in past and current literature, societal views, and teacher observations. Alan explains that language is abstract so boys, who are struggling with reading or writing, rarely have the skill.

When there’s a huge gap in understanding and performance between boys and girls, boys end up failing because they don’t have the prerequisite skill to go onto the next level. Each year builds on the last. It’s not true for just literacy but for all subjects (Alan, 2015).
Amy suggests finding the right novel is very important for students who are struggling in literacy. “I find that that really does engage the boys. They seem more interested when it’s factual as opposed to fictional.” This suggests that male and female students learn using different learning styles and respond to different pedagogy used by the teacher. Amy suggests that, to appeal to the learning style of the students in class, teachers should add a variety of teaching strategies into their lesson plan, which will be discussed in more detail in the TIPS AND STRATEGY section below.

4.2.3. Learning Strategies, Self-Regulation, and Coping Mechanisms

Many teachers and literature in teacher’s college teach that boys lean towards informational texts as opposed to narratives, non-fiction as opposed to fiction (Lindberg et al, 2010; Matthews, Ponitz, & Morrison, 2009). This shows that the learning styles for boys could be responsible for why boys don’t succeed as much in literacy as girls. They are not interested in the novel! Does this mean that the solution to improving male achievement in literacy is to allow choice during novel study or reading time? More research is still needed before we can attempt to generalize all literacy problems in this way but it is interesting to note that the interest and preference can affect achievement and that teachers are unknowingly catering to the preference and interest of girls more than the boys.

Regarding math, Alan observed that boys are not as behind as in literacy. A possible reason for this is that “boys like feedback more” (Alan). For math, feedback is quick and specific whereas for language, there are more options and room for mistakes like grammar, vocabulary,
flow, tone, etc. This difference in feedback explains why boys find it easier to catch up and succeed for math but hard for language.

Learning habits also include self-regulation and coping mechanisms that students use when faced with a difficult or challenging problem. Female and male students differ in the coping mechanism they fall back on and this could be a source of the gender gap. This is supported by Matthews, Ponitz, and Morrison (2009), who found that girls outperform boys in self-regulation to a significant degree (Matthews, Ponitz, & Morrison, 2009). Amy says,

When there’s boys and girls with learning disabilities, the girls with learning disabilities are far better at using coping mechanisms to be successful than the boys are (Amy, 2015).

Self-regulation in students can be an indicator of success later on in their academic career, as proposed by Matthews, Ponitz, and Morrison (2009). Amy observed in the classroom that boys are often much less able to find coping mechanisms and self-regulate their behavior, which often leads to struggles in the classroom. The difference in self-regulation can explain the reason for boys’ underperformance in the classroom.

Additional research by Silverman (2003) and many other researchers show that female students are achieving higher grades and widening the academic gap between male and female scores. Silverman explains that “girls tend to build stronger relationships with teachers, attain higher grades, achieve higher levels of education, and progress better scholastically overall than boys” (Silverman, 2003, p. 461). This raises questions as to whether female students are achieving better grades because of their own intelligence or because they tend to develop closer
connections with teachers and thus receive more help. This shows a superior coping strategy when they don’t understand a concept.

I think it depends on the profile of your class and it also depends on the independence level of the kids, whether they’re willing to look beyond the words to see what the questions look like and try to do some thinking as to what’s being asked or whether they’re going to abandon ship and ask for help immediately. (Amy, 2015)

Amy suggests that a gendered difference in social skills impacts academic performance, which could explain the achievement difference between boys and girls in the classroom.

4.3 Gender Gap in Terms of Social-Cultural Factors and Expectations

Many external factors play a part in the presence of a gender gap in classrooms. These are socioeconomic factors, race or cultural perceptions, teacher perceptions, parent perceptions, and student identity. These factors emerged from the interviews, especially when taken into consideration the two teacher’s different teaching environment in terms of socioeconomic level and demographic of the students.

First, my interview participants come from very different communities in terms of socioeconomic level. Alan teaches in a predominantly mid to low income neighbourhood while Amy teaches in a very affluent community. The barriers and challenges they face concerning their struggling students are very different in terms of resources and assistance they receive. For Amy, “students and their parents have the money and influence to hire tutors or buy assistive technology to help their child succeed, no matter their gender.” This indicates that parents for
both genders have access to resources and assistance outside the school in order to help their child succeed. However, even with the unlimited extra-curricular help, boys in the class are still struggling. On the other hand, Alan relays that the parents of his students often don’t have the time, resource, or energy to find extra-curricular help when their child is struggling. Although the two classrooms are different in terms of access to resources outside of school, both of them exhibit the same gender of struggling students. Although socioeconomic level creates an equity issue amongst students, the gender gap may not be affected by socioeconomic level. It persists in spite of it. In addition to access to resources, socioeconomic differences also highlight differences in access to technology. For example, in Amy’s class, all students have access to technology in the form of tablets and laptops. Male students rarely use their technology to further their learning, instead using it to peruse other activities like playing games. Paradoxically, female students have access to the same technology but choose when to use it and are succeeding. Technology is meant to help students succeed in academics but the degree of help depends primarily on how the technology is used.

4.3.1 Racial and Cultural Factors and Expectations

North American cultural stereotypes propose that boys don’t enjoy reading and struggling with reading and writing. As well, there is a prevalent stereotypical view of men and women where males excel in math and science while females succeed in reading comprehension (Lindberg et al, 2010; Matthews, Ponitz, & Morrison, 2009). As I mentioned before, classroom teachers sometimes subconsciously bring this belief into the classroom and reinforce it through their teaching. Both of my participants agreed that boys don’t enjoy reading and do not become
as engaged in it when compared to girls. However, they also propose that boys are more interested in non-fiction reading materials and that it takes more effort to find a quality, interesting novel for boys to be engaged with. In this way, is male indifference to reading being compared to female engagement compared using the same genre of book or compared using books that the gender actually engages with? Teachers might be confused by the fact that boys aren’t interested in the book genre and mistake that as indifference to reading in general, which would be a gross simplification. As research shows, boys are actively participating and engaged with literature they can relate to (Matthews, Ponitz, & Morrison, 2009). So the indifference to reading amongst boys might just be due to the fact that they haven’t found the right one yet. In order to prevent this, teachers should give a greater variety of books for boys to try and be mindful of the cultural preconceptions we bring into our classroom and our teachings.

In addition, society has expectations for the behaviour of both boys and girls. Alan describes how these views can be carried into the classroom by practicing teachers. In addition, these stereotypes can be used to explain the gender gap in terms of behaviour and concentration during class. Alan describes, in the quote below, how he believes gender stereotypes can affect teachers’ behavior, which in turn could create the gender gap in performance.

We expect boys to be aggressive and girls to be calm and submissive. So subconsciously, boys are allowed the opportunity to assert themselves and make decisions and act quickly than girls. (Alan, 2015)

This type of generalization about male and female behaviours is very commonplace and stereotypical in North American culture. In this case, it’s used to explain that girls have the
behaviour to sit still, concentrate, and think through problems as opposed to boys, who make quick decisions. This behaviour difference can account for difference in achievement between boys and girls. Stereotypes like this are also supported by research. One example is Picho and Stephen’s (2012) experiment that showed that stereotypes negatively impacts female students across various cultural and geographic groups. This begins to affect girls at a very young age, as early as five years old. Negative stereotypes concerning girls’ mathematics ability are reinforced through differential treatment towards girls in society, at school and at home (Picho & Stephens, 2012). Although this premise is the opposite of actual classroom observation from my interview participants, that girls were struggling in math compared to boys, Picho and Stephens’ research suggests that prevalent cultural stereotype of behaviours expected by society can be subconsciously reflected in teachers’ attitudes and reflected onto the students. When applied to both genders, it shows that stereotypes can be picked up at a very young age and can explain the achievement gap between genders.

### 4.3.2 Teacher Perceptions Can Create Gender Gap

Teachers’ perceptions of the student often impact their performance as well as evaluation. For example, Amy said that “Girls are better suited for the behavior expectations in the classroom” (Amy). This innocuous statement shows that teachers often have a set of ideals that dictates what is considered ‘learning’ and ‘good behaviour’. Since all students are different, with different personalities and learning styles, teachers can subconsciously favour one gender over the other based on their perception.
We can see that teachers often judge success based on their own standards. For students, coping mechanisms could be varied because each student has a different learning style. A teaching strategy might be unsuccessful for one student but successful for another. Since the majority of teachers are female, they might have a hard time understanding their male students. This disconnect across genders might also be a reason for the gender gap. Research supports that teachers’ perceptions were very important and gender of the teacher might also be a factor. Peterson’s (1998) study showed that teachers’ perceptions were very important and provided a major source of bias and discrimination in the scores of students because it often depended on the gender of the student who was writing the paper. In elementary and middle grades, scores for girls’ writings were consistently higher than on boys’ writing (Peterson, 1998). Peterson (2001) also looked at the teachers’ perception of gender in the writing of young students. She asserts that kids often find gender stereotypes and identities in how they write and the topic they choose.

Girls usually wrote about friends, family, pets, and personal experiences such as going to the mall, taking dance lessons, and breaking a leg by falling out of a tree, whereas boys usually wrote about sports, space, mythical creatures, adventures, and animals (Peterson, 2001, p. 451).

This shows that gender plays a large role in the topics of student writing due to stereotype and expectations from society. Also, the research asserts that teachers have a fairly large role in understanding the preference and interest of boys so we have to remain objective when assessing their work (Peterson, 2001). Definitions of ‘successful’ and ‘well-written’ might be different for
each person so it would be vital for teachers to define these terms and become familiar with all of students’ work before giving an evaluation.

4.3.3 Parent Perceptions

Perceptions from parents also affect the student, whether positively or negatively. This idea came from various literature about mother-daughter priming covered in my chapter 2 literature review. Since the premise for most of the literature was that girls struggled in math because of influence from the mother, I initially discarded it in my interviews and didn’t think back on it. However, as I reviewed my interviews, I realized that perceptions from parents play a large role in a child’s environment and the classroom and could have a large impact on the achievement between genders.

One example given by Alan showed that some parents place more pressure on the girls to succeed than the boys:

-I’ve seen parents, same parent with a boy and a girl, different years. The girl’s doing ok and they say, “You gotta try harder.” The boy’s doing worse, “Eh don’t worry about it.”

(Alan, 2015)

Alan observes that this type of exchange with parents is common in the school and he quotes the idiom, “Boys will be boys”. Whether this contrast between boys and girls is merely perspective or cultural requires more research but we can see through this exchange that parents can have a set of expectations for their daughter than for their son. This expectation plays out at home and in the classroom. Amy supports using her experience:
The parents come in for a pair of twins I have in the class, one boy, one girl. Both of them need extra help for math. For the boy, the parents said, “He’s never been good at math. Not interested, not going to go into math” but for the girl, they said “But her (older) sister is so good at math! She should be good too!” (Amy, 2015)

These two examples suggest that parents play a different role depending upon the child’s gender. The interplay between cultural expectations can prompt parents to push their child differently, which can result in differences in academic performance between boys and girls.

**4.3.4 Student Identity Can Create Gender Gap**

Students have social pressure to stay in roles and are very conscious of gender roles and barriers, which constrains their writing (Peterson, 2001). This can be seen in research literature, that identity and self-perception can consciously or subconsciously affect a student’s academic achievement. Picho and Stephens (2012) assert that stereotypes negatively impacts female students across various cultural and geographic groups, and that it begins to affect girls at a very young age, as early as five years old. Negative stereotypes concerning girls’ mathematics ability are reinforced through differential treatment towards girls in society, at school and at home (Picho & Stephens, 2012). It’s interesting that research looks into the priming of girls and how female students would allow identity and stereotypes influence their achievement when the direct opposite is happening in our schools. The girls are succeeding while the boys are being left behind. It is unknown whether priming and negative stereotypes also happen in the background or if there is another factor that plays into it that allows female students to achieve, regardless of
the negative priming. However, we can see from this research that students are affected by stereotypes and it makes up their identity. This can be applied to boys, which we see in the classroom.

Alan gives a good example of how identity plays out in his classroom.

Boys think it’s not cool to read. It’s not cool to get good grades. It happens more in high school. Some boys will be doing fairly well, be getting a 75, and they see how low can they go on the final test and still pass. And it’s like a badge of honour right? (Alan, 2015)

This suggests that boys identify with fitting in and not about succeeding in school. In some ways, they believe that it’s not masculine to do well in school. It’s about relatability and construction and maintenance of identity. This type of environment is a hazard for our students. However, students pick up stereotypes that apply to their identity at a very young age and it becomes reinforced at school through their peers and even teachers. This ties back to reliability for boys. Stereotypes should not have a place in schools. Teachers need to take the initiative to bring awareness and be proactive to prevent stereotypes from playing a part in students’ academic achievement.

4.4 Tips and Strategies To Assist Struggling Male Students

My research participants both admit that there is a gender gap in their classroom and that it is worrisome for the success of the students. As teachers, it is our duty to prepare ourselves to
face these challenges when we enter our own classroom. Male students face difficulty in math and literacy. Some great strategies we can use are:

**4.4.1 Shared reading**

Amy and Alan both support shared reading as a way to support boys who struggle in literacy. Amy observed that, in order to create a supportive, learning experience, it’s important to create a safe environment where everyone feels comfortable to read out loud. To differentiate for struggling readers, Alan suggests teachers to do reading comprehension activities that are teacher-led so the vocabulary is accessible. Even though struggling readers may not be able to do the reading independently, they are still developing their vocabulary and getting exposure to content that is their level or higher.

**4.4.2 Topics of Interest**

One of the most important issues to engage male students who underperform in literacy is finding the literature that interests the student. That could be author, genre, or topic. The important aspect is finding something that students can relate to to be interested and remain engaged.

Amy suggests to prepare novels centered on current events. Reading material can include novels, newspapers, magazines, and online articles. This helps readers understand and improve but also is a topic of interest for all students. For Amy, she uses a series called “What in the World?” which is a series of informative booklets that include articles that are student-friendly with vocabulary at low, medium, and high comprehension levels.
They tend to be around humanitarian issues, social justice issues, current events, things that kids could actually relate to in the news if it was written for them, at their reading level with vocabulary built in and that sort of stuff. I find that that really does engage the boys. They seem more interested when it’s factual as opposed to fictional.” (Amy, 2015)

Allen observes how choosing articles or project ideas that center on a topic of interest can motivate and engage struggling learners but also aid in introducing new and interesting content to learners who have been performing well academically.

4.4.3 Chunking

All subjects have jargon and vocabulary that can be confusing for struggling students. For math, Amy suggests working on dissecting what the vocabulary means to help students understand what the question is asking.

Often, students have trouble understanding the question. They know how to solve it but they can’t get over the first hump of understanding it. So dissecting what the words mean in order to help them access what is usually quite simple math once they understand what the words mean. (Amy, 2015)

Chunking helps struggling students understand and assimilate the concepts faster and easier.
4.4.4 Be a Good Role Model

Teachers have the opportunity to play a positive role in students’ lives. Students often learn more from teachers’ actions and speech. So role modelling is important to establish a safe environment and for students to aspire and learn from. Alan’s example shows how just being a teacher can affect students and their futures.

I remember a parent came back. Her son was here seven or eight years prior. She said he never thought of being a teacher because he had only seen one male and most female teachers. So you can never discount the effect of simply being closer in likeness to your students, whether it’s gender or cultural or linguistic. (Alan, 2015)

Every student and class is different so avoid using blanket statements. According to the participants, it may be a good idea to look at the profile of the class and get to know each student personably.

In some years, the girls are weak and it’s not the boys. So you have to really understand who you’re dealing with so you can help in the best way possible. (Amy, 2015)

Although the teachers acknowledge and may be concerned about the gender gap they witness in the classroom, they also insist on considering student performance on an individual basis.

Additionally, both Amy and Alan emphasize the importance of inclusivity for all genders as well as culturally through language used in activities, instructions, or casual conversation.
“The way you speak, spoken word, the words that you choose often can motivate them”

(Alan, 2015)

As future educators, we must strive to be agents of change. This emphasizes the influential role that teachers can and do play in and outside the classroom. Such decisions can include seating arrangements, what to hang on the walls, how to solicit answers from students, and what examples to use during instructions. If we pay attention and be aware of what films to show and what readings to recommend, we can change these gender stereotypes that students bring into the classroom. Our beliefs can be reflected in how we praise, discipline, and respond to questions and issues arising around gender, race, sexuality, and other issues in society. There are barriers like administration, faculty, fellow staff members, principals, and parents but teachers have autonomy to decide what to teach and how to teach it. Kewley (1999) gave an example of a group of teachers who went around the school and removed any material that had a mom in an apron and a dad with a briefcase. These small actions, such as taking down posters that reinforce gender norms, can create a welcoming and equal atmosphere for both genders.

4.5 Conclusion

In this chapter, I reported the emergent themes gathered from interviews with research participants and placed them into conversation current researchers and their findings regarding gender achievement gap in classrooms. I learned that dedication to challenging gender stereotypes in the classroom starts from within and each teacher must develop their resources to support all students in the classroom. Nevertheless, my interview participants have provided
valuable strategies that will help any teacher who wish to address these issues. But, most importantly, it is about creating a safe and inclusive space to talk about these issues. Next, in Chapter 5, I discuss the significance of these findings in the context of the literature reviewed in Chapter 2. I explain how the findings contribute to this existing body of educational research and identify areas for further research these findings provoke, and I articulate recommendations for various stakeholders of the education system.
Chapter 5

DISCUSSION

5.0: Introduction

The relationship between gender and academic achievement is a pressing concern for the education community. After analysis of two interviews with experienced, classroom teachers and cross-referencing with research and literature, I have compiled a list of similar themes and key findings. Most importantly concerning classroom achievement between genders, despite parents’ and teachers’ best efforts, social factors play a large role in classrooms interactions and evaluations. The interview participants all recognized the issue of achievement inequity between boys and girls, though they disagree on how wide the achievement gap is. Despite this, I feel the more important question is how we, as teachers, can use the findings to help bridge the gender achievement gap in our classroom. In this chapter, I will summarize my key findings, discuss their implications, and provide recommendations for classroom teachers to encourage student success and differentiate teaching to reach all students, regardless of gender.

5.1 Overview of Research

Through my interviews, I have compiled the three main themes that describe possible sources of the gender achievement gap in classrooms. They are Gender Issues: Teacher Observations, Biological Factors, and External Factors and Expectations. Firstly, teachers often have different opinions about the difference in academic achievement between male and female students, which we represent with the term ‘gender gap’. 
In different classes, the gender gap might favor girls, be non-existent or favor boys. Because the demographics of each class varies, one of the things teachers should be wary of over-generalizing particular research findings from the literature. In this case, when the debate in gender achievement is still controversial, teachers should get to know their class and differentiate their plans to reflect their class and individual students.

Additionally, teachers do not agree about the source of gender gap or even that it exists. Pedagogy and systemic biases are often not considered. Teachers often attribute the difference in academic achievement to maturity and hormones. As Amy said (2015), “Boys have yet to begin or finish puberty. Girls are often mid to through it. You can see that kids with learning disabilities in younger boys, maturity is often the most key piece.”

Maturity is often linked to the ability to sit still and concentrate for a period of time. Teachers often see boys who suffer academically because they lack the learning skill of concentration. On the other hand, Hall (1997) references Benbow and Stanley (1980), who suggest that gender differences in mathematic performance can be explained on the basis of genetic underlying ability or a ‘superior male mathematical ability’. However, this research is controversial as contemporary research have offered evidence and support against Benbow and Stanley’s ‘biological male superiority’ (Matthews, Ponitz, & Morrison, 2009; Bursal, 2013; Voyer & Voyer, 2014) In addition, my participants have witnessed in the classroom that girls are able to sit and concentrate throughout class and thus perform better academically than boys. Other skills that could be tied to maturity are motivation and self-regulation (Matthews, Ponitz, & Morrison, 2009), which research and interview participants agreed that girls had better self-regulatory and self-motivational skills than boys.
Aside from biological traits, external factors and expectations play a part in the perception of a gender gap in the classrooms. Factors such as socioeconomic difference, race, culture, teacher identity, parent identity, and self-identity all play a role in perpetuating the stereotype that boys can afford not to try hard and succeed. Considering that our teaching, students, and school environment cannot be isolated from the community, ideals, and background of the student and staff, external factors make up a large portion of the expectations placed on the student and this is something teachers have to learn to navigate while differentiating our teaching pedagogy to cater to the learning needs of all students.

I found many great strategies in my research and from my interviews. Some important strategies are shared reading, providing students with materials from a variety of genres and topics, chunking information or new material, and being a good role model. Tackling the issue of gender gap in the classroom will require a variety of different strategies which will not all be successful with every boy or girl but will help in the learning of all students.

5.2 Implications

5.2.1 Broad Implications

This research paper suggests the necessity of bringing gender equity to the forefront of the classroom. This research can impact the educational community and policy makers primarily through the work of teachers. Educators, staff, and administrators can help each other to be aware of the academic performance difference between male and female students and seek strategies and pedagogies to assist struggling students. From my experience, OISE has not
addressed nor acknowledge the gender academic gap, much less provide newly-qualified teachers with the means to assist students and address the academic inequity in the classroom. This suggests that educators and policy-makers should perhaps seek to incorporate the issue of the gender gap into the teaching program. By creating on-going public discourse about male struggles in academic classroom, we can draw attention and support for further research into possible sources and strategies that can accommodate for struggling students to provide equity in the classroom.

5.2.2 Specific Implications

My interview participants both agree that the acknowledgment of academic struggles by either male or female students are often attributed to individual capabilities instead of social construction that produces the achievement gap between male and female students. Educators and policy-makers should perhaps seek to incorporate the issue of the gender gap into the teaching program to help teachers reflect on personal biases and compile a tool-kit of strategies to assist struggling students.

I have learned several strategies that can impact the way teachers encourage and motivate students to learn. I will review some strategies that are often used to assist struggling readers, more commonly boys, to develop a greater enjoyment in reading and literacy classes. I will also share some strategies to help struggling students in math and science. Finally, I will discuss pedagogy and classroom arrangement to encourage student engagement and belonging in the classroom so they feel comfortable taking risks to learning and succeed. These strategies are not gender specific and can be used for all struggling students, although the focus is for teachers to
acknowledge the gender gap in the classroom and be responsive to assist male students who are struggling by utilizing these strategies.

First, shared reading creates a supportive learning environment where students can practice reading out-loud with peers of the same level and teachers can assess and evaluate reading levels and improvements through comprehension activities. This way, struggling readers can continue to develop vocabulary and get exposure to content that is at their current level or higher.

Secondly, selecting topics and literature that interests the student is very important in cultivating engaged and motivated readers. This can differ in genre, author, characters in the book, popularity, etc. In this way, teachers should provide a variety of literature that includes fiction and nonfiction, current events, novels, newspaper, magazines, and online articles. Teachers can personalize their library based on the ethnicity, race, background, and hobbies of the students in the class. This way, students develop identity and self-reflection when reading a book that mirrors their culture and ideals.

In terms of science and math, teachers should chunk information. Especially for subjects that involve specific jargon and vocabulary, teachers should take time to effectively explain and define the terms to help students understand what the question is asking.

Overall, I believe the most important strategy to help struggling male students is to be personable and to cater to the needs of each student. Often, struggling students are isolated due to social differences. Teachers can set a good example by getting to know each student personably and avoid using blanket statements. This is important for inclusivity of all genders as well as
cultural, racial, and class.

5.3 Professional Identity and Practice

As this is qualitative research, the interpretations and emergent themes are colored by my personal biases, background, privileges, and viewpoints. My identity and my participants' identities are intertwined in the answer, analysis, and conclusion we draw and share. Although we try to be as politically and socially neutral as possible in interview questions, answer, and analysis, there is evidence that sexist views do emerge. I want to state that the purpose of this paper is not to advance those views, nor is it meant to oppress a particular sex. By drawing attention to a possible gap in performance between genders, I wish for educators to gain awareness that it may be present in the classroom. Current, experienced teachers recognize that boys and girls are not achieving at the same level and use appropriate strategies and pedagogy to assist all students that are struggling, regardless of gender.

5.4 Recommendations

Curriculum and professional practice are the foundation for creating an equitable and fair opportunity for both sexes to succeed. Inside the classroom, teachers can adopt strategies and pedagogy to meet the needs of the struggling gender, while fostering a positive and safe learning environment that would incorporate both sexes into cooperative learning, such as well-planned Guided Reading groups and shared reading. Although one gender might be struggling, teachers should be careful about isolating and catering to their needs to the detriment of the other gender. An example of this could be assigning a topic or reading material that female students might not
be able to relate to or have interest in. As a new teacher, I will avoid making assumptions before getting to know the class. I will avoid making generalizations about the group based on the performance of a couple of students. For example, if a handful of boys struggle with reading, this is not necessarily evidence of an achievement gap based on gender. So teachers should be aware of their own biases and conceptions when interacting with a class and be willing to practice reflexive thinking when an assumption is formed.

Based upon participant suggestions, teachers can support struggling male readers by providing more non-fictional or non-traditional texts such as graphic novels, social media, websites, e-books, playing cards, manuals, or video games. Graphic novels or comics are not always educational or appropriate, so we need to apply professional discretion to teach academic graphical texts to male readers. Most importantly, teachers must foster a love of reading by supplying literature that appeal to students from all gender, sex, age, background, preferences, culture, and reading levels. Teachers must work with parents and the community to help provide access to a wide variety of high-quality books and reading time outside of school, to help students with their reading skills. Additionally, to counter self-identity in male students that ‘failing’ is ‘cool’, teachers can provide literature that can steer boys away from stereotypically male ideals and seek resources that challenge social and cultural stereotypes. Literacy competency is important no matter the grade or gender of the student. Often, competency in literacy correlates with success in other subjects like math, science, social studies, even music and art.

Although I concentrate on the binary of sex in this research, other factors play a large role in academic success, such as socioeconomic status, race, religion and ethnicity. The strategies
and pedagogy teachers can use in the classroom to engage the struggling gender is just one piece of the puzzle. Intertwined are other issues like the opportunity gap, where students have different levels of societal opportunities and privileges open to them. These issues are often hidden behind gender and the immense pressure on teachers to improve and maintain student success in grades and class performances. Teachers should learn and discuss these issues, privileges, and opportunities with students to work towards understanding how societal issues are intertwined with student academic performances and can and should never be isolated.

With so many strategies and tips to bridge the gender achievement gap in the classroom, there is no definite set of strategies that will work for all students. Teachers should get to know and understand students individually and find their interests and hobbies so they can be incorporated into daily lessons to increase relevant learning and engagement in the classroom. Outside the classroom, teachers must work with the school, parents, and community to develop and implement texts, strategies, and motivation to learn.

5.5 Areas for Further Research

The issue of achievement gap between genders is worthy of additional research, inquiry, and debate. There should be more discussion about this issue because it brings awareness to inequity in schools. I wanted to look deeper into perhaps systemic factors that could favor one sex over the other. However, research and discussions between classroom teachers and researchers are lacking. While there are many visible and, perhaps, invisible causes for the gender gap, there are just as many potentially successful strategies to help teachers assist the struggling gender. As I stated before, each class, much like each student, is different. One year,
the struggling gender could be boys, while the year after, it is girls or neither. The strategies available to teachers can help the struggling gender regardless of sex. I believe the best strategies for bridging the gender gap will reach out to all students, will be approaches that do not focus solely on the gender of the students, but ones that also address economic status, race, and ethnicity. These issues are intertwined in our teachings and community so we should address them for the success of our students. Future research could seek to explore the process of developing self-regulatory skills amongst struggling male students and seeing how their academic performance can change.

Additionally, the lack of other gender identities in research and interviews concerns me. It hides the existence and perspectives of students who do not self-identify as ‘girl’ or ‘boy’. These issues are only just emerging in regular classroom discussions. Educators can use this opportunity to incorporate the new mindset of more than two gender groups and see how this changes the gender achievement gap in the classroom. I understand that my research concentrates primarily on the boy/girl binary but if we can include students that self-identify as LGBTQ+, perhaps we can see the relationship between social identity and self-identity and how it connects to academic performance.

5.6 Conclusion

Two years ago, I started my journey thinking about what I wanted to focus my research on. I wanted a controversial topic that would help advance educational knowledge and also prepare me for my own growth as an educator and researcher. I chose to delve into the topic of
gender achievement gap in the classroom because I thought it was an important issue to bring to the forefront. Society often has such a rigid preconception about how one sex would be better at a subject than the other (e.g. boys are good at math, science, and computer and girls are good at literacy) (Weaver-Hightower, 2003). I wanted to see if research agreed and whether educators witnessed it in the classroom. As a newly qualified teacher, I hoped my research would aid me with tips and strategies to provide an equitable and equally challenging curriculum to both my female and male students.

Through the course of my research, I have learned that research is still inconclusive, although the majority of current research supports that females are achieving in academics more than boys. Educators also witness this gender gap first-hand in classrooms every day. Based upon my interviews with participants and consultation with the literature, the possible sources of male underachievement in academics have roots in teachers’ observations, biological factors, such as maturity and hormones, and external factors and expectations, such as socioeconomic, racial, cultural, as well as teacher, parent, and self-identity.

The school community is the foundation of student achievement. Teachers, parents, and administration factor into this discussion. Developing an awareness of our own biases and actions is a good start to addressing gender gap in the classroom. There is still a lot of research left to be done about equity in the classroom and the gender gap. Thanks to current research and my interview participants, I have learned many strategies and classroom pedagogies to encourage my growth as an educator. I feel more equipped and knowledgeable to identify struggling students and how I can assist students, regardless of gender, to succeed academically.
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BRIDGING THE GENDER GAP IN THE CLASSROOM


University Computer Science Education. Thesis for Doctor of Philosophy, Department of Sociology and Equity Studies in Education, Ontario Institute for Studies in Education, University of Toronto.


Appendix A: Letter of Consent for Interview

Date: ____________________

Dear ____________________,

I am a graduate student at OISE, University of Toronto, and am currently enrolled as a Master of Teaching candidate. I am studying the academic achievement gap between boys and girls in Intermediate years for the purposes of investigating an educational topic as a major assignment for our program. I think that your knowledge and experience will provide insights into this topic.

I am researching gender achievement gap in Intermediate years. The academic gap between female and male students has been a widely discussed and debated issue in both societal and academic literature. It's important to keep in mind that other circumstances factor into creating a gender gap, including, but not limited to, gender identity, social and biological constructions, gender roles, developmental factors and cognitive differences between females and males. This study aims to critically examine the achievement gap between boys and girls in the junior/intermediate grades of 6 to 9 by looking at the challenges that discourage genders from engaging in mathematics and science. Additionally, this study will evaluate various strategies to aid teachers in motivating students and decreasing the achievement gap in their classes. The data collected for this qualitative study derives from interviews that were conducted with exemplary educators. Findings indicate social construction of gender roles and home environment towards mathematics and science for both female and male students. The findings will also suggest several strategies teachers can employ with the students to reduce the achievement gap and foster interest in both sexes towards mathematics and science.

I am writing a report on this study as a requirement of the Master of Teaching Program. My course instructor who is providing support for the process this year is Dr. Angela MacDonald. My research supervisor is Dr. Angela MacDonald. The purpose of this requirement is to allow us to become familiar with a variety of ways to do research. My data collection consists of a 40 minute interview that will be audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient to you.

The contents of this interview will be used for my assignment, which will include a final paper, as well as informal presentations to my classmates and/or potentially at a conference or publication. I will not use your name or anything else that might identify you in my written work, oral presentations, or publications. This information remains confidential. The only people who will have access to my assignment work will be my research supervisor and my course.
instructor. You are free to change your mind at any time, and to withdraw even after you have consented to participate. You may decline to answer any specific questions. I will destroy the audio recording after the paper has been presented and/or published which may take up to five years after the data has been collected. There are no known risks or benefits to you for assisting in the project, and I will share with you a copy of my notes to ensure accuracy.

Please sign the attached form, if you agree to be interviewed. The second copy is for your records. Thank you very much for your help.

Sincerely,

Researcher name: Yifan Chen
Phone number, email: 647-867-9207, yifan.chen@mail.utoronto.ca

Instructor’s Name: Rodney Shaun Handelsman
Phone number, email: rodney.handelsman@utoronto.ca

Consent Form

I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw at any time without penalty.

I have read the letter provided to me by Yifan Chen and agree to participate in an interview for the purposes described. I agree to having the interview audio-recorded.

Signature: ______________________________

Name (printed): ____________________________

Date: ___________________
Appendix B: Interview Questions

Section A: Background Information

1. How many years have you worked as a teacher?
2. What grades and subjects have you previously taught?
3. Can you describe the community in which your school and/or former school is situated (i.e. diversity, socioeconomic status)?
4. When did you realize the academic achievement gap between the sexes in your classroom?
5. What were some preconceptions you had concerning achievement gap before witnessing it in your classroom?

Section B: What/How?

6. In my classes at OISE and the research I have conducted for this project, I have found that there is a lot of discussion and concern about gender achievement gap in mathematics and literacy. Do you notice a gender gap in your own classrooms? If so, what seems to be the trend?
7. Do you notice a difference between boys’ and girls’ attitudes toward literacy?
8. Do you notice a difference between boys’ and girls’ attitudes toward mathematics?
9. What strategies have you used to motivate the struggling gender to read or take a greater interest in math?
10. Can you tell me about a specific lesson or unit you have taught in which you had a special focus on engaging the struggling gender?

Section C: Why?

11. Why do you believe there is a disconnect between successes of the genders between elementary and high school?
12. Is there a culture in the local/national community that supports or discourages one gender from engaging or succeeding in mathematics or literacy?

Section D: Barriers/Next Steps

13. What challenges have you encountered in terms of engaging the struggling gender in mathematics? In literacy?
14. As a beginning teacher, what advice do you have for me in regards to mending that gender gap in my own classroom?