

High-Ability Middle School Girls in Independent Schools

by

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Submitted in partial fulfillment of the requirements for the degree

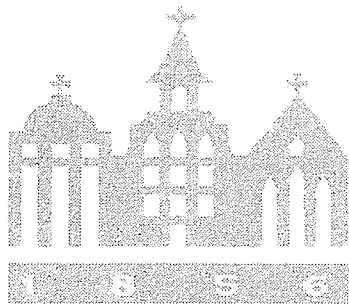
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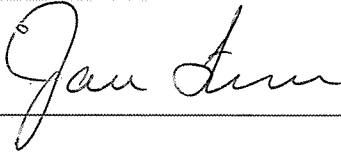
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Maria Arellano has successfully defended and made the required modifications to the

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ABSTRACT

Research shows that middle school is a critical time for gifted girls. There is much research as to why and the ways in which girls' intellectual ambitions significantly wane during the middle school years, but not much on how to combat the issue. Whatever studies have been conducted in the area of gifted and talented female learners has been largely done in the public sector. Given the unique culture and practice of independent schools existing research on this topic in public schools does not provide a clear view of how independent schools are catering to their most highly able female learners.

This qualitative study explores how independent school teachers characterize their high-ability girls; the practices/procedures that independent schools employ to identify their high-ability middle school girls; the resources, structures, and supports in place to meet high-ability girls' academic needs; and training in instructional practices and professional development provided to teachers to educate about high-ability girls' academic needs.

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Chapter 1

Introduction and Background

Gender and Education

Societies have recognized the value and importance of fostering the brightest of their citizens so that they can contribute their talents to society (Tannenbaum, 1983). Gifted and talented programs and research came to the fore in the United States after the Soviet Union launched Sputnik in the 1950's. The country became concerned that we would fall behind in the areas of science, math and technology. There was, then, a concentrated effort to look at ways to improve and implement gifted and talented education programs and initiatives (Tannenbaum, 1983).

Society then became extremely interested in biological sex differences among gifted children despite the fact that gifted girls and gifted boys are actually more alike than they are different (Kerr, Vuyk & Rea, 2012). For well over 100 years, it has been shown that, in general, girl and boy children's play interests are similar (Gross, 1989; Terman, 1925). They also have very similar career aspirations (Kerr, Vuyk & Rea, 2012). Meta-analyses of biological sex differences in cognitive abilities have consistently shown that sex accounts for a very small fraction of the variance in measure abilities (Halpern et al., 2007).

Now knowing this, gender equity in education has shifted. A study conducted by Benbow in 1992 showed that fewer females were labeled as mathematically gifted than males and less likely to take demanding high school math and science courses. A 2012 United States Census from the Office of Civil Rights in the United States Department of Education shows a changing narrative. The report states that in 2009, 8.1% of girls

participated in gifted and talented programs compared to 7.4% of boys. The report states that “girls are equitably represented in rigorous high school math courses.” Furthermore, girls outnumber boys in enrollment in AP science, AP foreign languages, and several other AP subjects (U.S. Department of Education, 2012).

Challenges for Girls During Their Schooling Years

Research shows that gifted girls actually enjoy the areas of math and science just as much as boys during elementary school, but they tend to believe that boys are intrinsically better at math. By 8th grade, boys are twice as interested in math and science as girls (Jensen & Nutt, 2015). Middle school appears to be a critical time for other reasons. Confidence in gifted girls drops dramatically. They become far less likely to take risks and fear making mistakes (Post, 2015). Measures of self-confidence are lower for 6th grade girls than for boys, but the differences were even greater in comparisons of gifted girls and gifted boys. In other words, the gifted girls felt much worse about themselves than the gifted boys (Post, 2015). Self-concept scores for both gifted and average ability girls dropped between 3rd and 8th grade, but the gifted girls had worse self-esteem related to their intellectual abilities and popularity (Post, 2015).

A June 2016 study found that video games pose another obstacle for girls in general. Most video games feature male characters, and girls are sometimes depicted in demeaning ways, either as sidekicks or hypersexualized. The Journal of Communication examined 31 years of female video game characters and found that while female characters were less sexualized than they were in the 1990s, they’re still far more sexualized than male characters (Lynch, Tompkins, Driel, 2016). A 2017 study by Nelson examined the academic

correlates of sexualized gender stereotypes. It also assessed the degree to which girls believed boys and girls should behave in accordance with such stereotypes. He found that higher endorsement of sexualized gender stereotypes was associated with lower academic performance and more negative academic attitudes. “These negative academic attitudes and beliefs may be particularly detrimental during adolescence, a time when girls are given more agency over their academic trajectory...” (Nelson, 2017).

We also know that there are fundamental biochemical and neurological differences in girls as compared to boys that aren’t necessarily taken into account by schools. While estrogen increases the desire for bonding and connection and discourages risk-taking, testosterone (which is 10 times higher in men than in women) propels boys to take more risks. The amygdala develops 18 months earlier in girls during early adolescence than for boys. Women's amygdalae are activated more easily in reaction to stressful situations; this lends itself to a tendency to worry and form strong emotional memories in response to negative events. In addition, the anterior cingulate cortex is larger in women. This relates to weighing choices and options, scanning the environment for threats, and noticing errors (Post, 2015).

Women in the Workforce

In the areas of math, science, and technology, women are still not reaching the highest ranks and levels of performance as males. A fascination with sex differences remains in part due to the “leaky pipeline” of women in the areas of science, technology, engineering, and mathematics (STEM). The 2012 United States Department of Education report states that despite women’s gains in some nontraditional fields as a whole, the rate

of female enrollment in certain career clusters “remains at persistently low levels.” In 2009-2010, females made up less than 25% of participants in science, technology, engineering, and math programs nationally (21% at the secondary level and 24% at the postsecondary level.) Between 2000-01 and 2008-09, the number of degrees and certificates awarded in science, technology, engineering and mathematics (STEM) fields to women at degree-granting institutions increased by 5.9 percent. However, in 2008-09, 31.0% of the degrees and certificates in STEM fields were earned by women (U.S. Department of Education, 2012). In 2016, the National Science Foundation found that only 17.1% of industrial engineers are women. In addition, women’s overall salaries and formal recognition are lower than males (2008). Women in science and technology earned an average of \$55,000 annually nationally in 2013, compared to \$80,000 for men (National Science Board, 2016).

Research shows that women are underrepresented in not just these areas of STEM, but in all levels of senior management in organizations (Rhode, 2015). At S&P 500 companies in the financial services industry, women make up 54 percent of the labor force but are only 29% of executive- and senior-level managers and 2% of CEOs. In the legal field, they are 45% of associates but only 22% of partners and 18% of equity partners. At the current rate of change, it will take until 2085 for women to reach parity with men in key leadership roles in the United States (Center for American Progress, 2017).

With the growing job market demand for leaders to fill positions, such as technology executive, communication specialist, and leadership training and development specialist,

schools are charged with the task of cultivating effective leaders for these 21st century roles (Sacks, 2009; Scheer & Safrit, 2001).

Problem Statement

Research shows that middle school is a critical time for gifted girls. There is much research as to why and the ways in which girls' intellectual ambitions significantly wane during the middle school years. However, the current literature on programming and ways to effectively cater to highly able girls' academic needs is scarce. Davis and Rimm state that if we fail to provide such opportunities for gifted children, there is "lost academic growth, lost creative potential and sometimes lost creative potential and sometimes lost enthusiasm for educational success and eventual professional achievements and substantial contributions to society" (2004).

Purpose

The purpose of this qualitative study will explore how coeducational independent middle schools are meeting the academic needs of their most highly able girls.

Research Questions

1. In what ways, if any, are independent schools focusing on the academic needs of highly able girls in the middle school years?
 - a. How do independent school teachers characterize their gifted and talented girls?
 - b. How do independent schools identify their high-ability middle school girls?

- c. What resources, structures and supports do independent schools provide for high-ability girls' academic needs?
- d. What training in instructional practices and professional development do independent schools provide to teachers to educate about high-ability girls' academic needs?

Rationale and Significance

As independent schools are tuition-driven, they are not reliant upon government funding, and, therefore, free from national and state regulations (Graybeal, 2017). It is for this reason that independent schools in the United States have remained largely removed from the larger, public national discourse about teaching and learning. Specifically, this includes federal K-12 law in which provisions are made for gifted and talented students under the 2015 Every Student Succeeds Act (National Association for Gifted Children, 2018).

Selective admissions procedures mean that independent schools can offer admission to the most academically capable students (Kohn, 2012). These schools have developed cultures that place a premium on individual expertise and autonomy to cater to such a population of students (Kane, 1992). This idea of autonomy essentially permeates every aspect of independent school culture and practice, especially as it relates to curriculum design, instruction and teacher supervision (Kane, 1992).

There is a relative dearth of research on independent schools in general. Whatever studies have been conducted in the area of gifted and talented female learners has been

largely done in the public sector. Given the unique culture and practice of independent schools (Graybeal, 2017), existing research on this topic in public schools does not provide a clear view of how independent schools are catering to their most highly able female learners. Independent school teachers' definitions of this population of students and how to best serve their needs may differ greatly from public school teacher perceptions. Moreover, while there is ample research that discusses the *reasons* why highly able girls' passions decrease in middle school, we are not having conversations about how to combat the issue, particularly in these formative years.

This study grew out of my own interest in discovering how independent schools are catering to the needs of their high-ability learners. Having worked at several K-12 coed independent schools (one in New York, one in New Jersey and one in Nevada), I have noticed some similarities among these institutions. Teachers and administrators will often cite that what the school is teaching in academic disciplines is a year or two ahead of their public counterparts. It appears that this is the reason that independent schools in which I have worked have not placed explicit focus on differentiated instruction, curriculum, or programming for their high-ability learners. There exists a ubiquitous sentiment that the students are already challenged enough with the rigorous curriculum provided. Across the board, when these schools have discussed students "in need of support", they have referred to students who are not meeting the academic expectations of the school and not high-ability students who may benefit from best practices in gifted and talented education. In my experience, independent schools learn from other independent schools and adopt the practices of other "top-tier" independent schools. "Top tier" is a familiar term among independent school educators. Such schools are not formally identified with specific

criteria. Instead, they are informally identified by independent schools in the same area or by reputation among community members. They are often the ones that appear in editorials and other articles. Often, they are known just for their relatively high tuition. I have found that part of the reason that independent schools try and emulate one another's academic practices is, in large part, due to competition. Independent schools want to make sure that they are offering the same as- and more than- what their fellow competitor schools offer. Ensuring a robust enrollment is the only way that most independent schools can ensure longevity.

Other observations have also spurred further exploration. In my current independent school, there are a higher percentage of boys who participate in Educational Technology Leadership than girls. Last year, there were a higher percentage of boys who were placed in advanced middle school math courses. Within my own middle school English classes that I have taught over the years, I have noticed that boys are far more physical and active in verbally seeking teacher feedback and attention. In turn, I spend more time engaging with the boys than the girls. I have questioned and pondered the ways to provide more equity among the genders in my classroom, and how to appropriately challenge, specifically, the girls who are talented in the areas of reading and writing.

With the ability to pay attention to the individual needs of students and highly selective admissions, independent schools are, in general, freer to address girls' special needs than their public counterparts. They can also allocate resources to specific areas, such as special programming for high-ability girls (Kane, 1992). The study seeks, then, to understand and explore how (or if) independent schools are, indeed, directing resources

toward its population of high-ability female students. If not, the study aims to understand why as well as the implications for high-ability female learners.

Conceptual Approach

There are many theoretical conceptions of giftedness. This study utilizes those of Francoys Gagné and Joseph Renzulli, both used by the National Association for Gifted and Talented Children. The Gagné framework makes a clear distinction between giftedness and talent. “Giftedness” designates the possession and use of untrained and spontaneously expressed natural abilities- otherwise called aptitudes or gifts- in at least one ability domain to a degree that places a child among the top 10% of his or her age peers. This is different than “talent”, to which he refers as the superior mastery of systematically developed abilities and knowledge in at least one field of human activity to a degree that places a child's achievement within the upper 10% of age-peers who are active in that field or fields. His model has five aptitude domains: intellectual, creative, socioaffective, sensorimotor and "others" (e.g. extrasensory perception). These natural abilities, which have a clear genetic substratum, can be observed in every task that children are confronted with throughout the course of their schooling (NACG, 2019).

Renzulli poses that “gifted behavior” happens when there is an interaction among three basic groups of human traits: above-average general and/or specific abilities, high levels of task commitment (i.e., motivation), and high levels of creativity. Gifted and talented children are those who possess or are capable of developing these traits and can then apply them to a valuable area of human performance. As noted in the Schoolwide Enrichment Model, gifted behaviors can be found "in certain people (not all people), at

certain times (not all the time), and under certain circumstances (not all circumstances)” (NACG, 2019).

Delimitations and Limitations

The limitations to this study are as follows:

1. The sample size, though purposeful, is small. By including teachers in only four independent schools, generalizations cannot be made about the perspectives and practices of all independent or public schools and their teachers in New Jersey and New York.
2. There is a potential for researcher bias in interpreting participant responses. The researcher works closely with department chairs and grade-level deans and has much professional experience connected to this topic.
3. There is a potential for respondent bias when responding to interview questions. There may be instances when a participant is unwilling or unable to honestly answer an interview question for fear of painting themselves or their school in a negative light.

The delimitations to this study are as follows:

4. Only middle school teachers for grades 6-8 in New Jersey and New York City were interviewed.
5. Elementary schools were not included because according to existing literature, it is the middle school years when academic interests of highly able female learners begin to wane.

6. Students were not interviewed about their experiences and perceptions of their experiences in their schools. Therefore, the number of data points and ability to cross-reference and validate my research using their perspective is limited.
7. Charter and public schools were not included in this study; only independent schools were used.

Definition of Terms

- Differentiation- modifying curriculum and instruction according to content, pacing, and/or product to meet unique students' needs in the classroom
- Enrichment- Activities that add or go beyond the existing curriculum. They may occur in the classroom or in a separate setting such as a pull-out program
- Gifted and talented student/high ability student- The federal Elementary and Secondary Education Act defines these students as "Students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services and activities not ordinarily provided by the school in order to fully develop those capabilities." [Title IX, Part A, Definition 22. (2002)] Many states and districts follow the federal definition (NAGC, 2019)
- Gender- refers to the attitudes, feelings and behaviors that a given culture associates with a person's biological sex. Behavior that is compatible with cultural expectations is referred to as gender-normative; behaviors that are viewed as incompatible with these expectations constitute gender nonconformity (APA, 2012)

- Identification- The process of determining students qualified for gifted or advanced programming, identification most commonly occurs through the use of intelligence or other testing. Many researchers place emphasis on using multiple pathways for identification, adding teacher, parent, or peer nominations or authentic assessments such as portfolios of student work to the process (NAGC, 2019)
- Male- a boy, man, or male animal
- Female- a female person or animal
- Independent schools- schools that are driven by a unique mission. These schools are managed by an independent board of trustees and each is primarily supported through tuition payments and charitable contributions. They are accountable to their communities and accredited by state-approved accrediting bodies (NAIS, 2019)
- Sex- refers to a person's biological status and is typically categorized as male, female, or intersex (i.e., atypical combinations of features that usually distinguish male from female). There are a number of indicators of biological sex, including sex chromosomes, gonads, internal reproductive organs, and external genitalia. (APA, 2019)
- Social-emotional needs- Gifted and talented students may have affective needs that include heightened or unusual sensitivity to self-awareness, emotions, and expectations of themselves or others, and a sense of justice, moral judgment, or altruism. Counselors working in this area may address issues such as perfectionism, depression, low self-concept, bullying, or underachievement

- Talent-development: Programs, curricula, and services for gifted and talented students that can best meet their needs, promote their achievements in life, and contribute to the enhancement of our society when schools identify students' specific talent strengths and focus educational services on these talents (NAGC, 2019)

Chapter 2

Literature Review

History

In looking at recorded history, it is apparent that cultures across the world have taken an interest in children who have demonstrated special talents. The Romans, Chinese and Japanese are among those who have focused on such efforts in attempts to further the good of their nations (Tannenbaum, 1983). During the Renaissance and post-Renaissance, young adults' special skills in the performing arts were nurtured through the apprenticeship system. Talented musicians like Mozart were sponsored by royalty and noblemen (Gallagher, 1984).

It is not until relatively recent times, though, that pointed studies of gifted children emerged. The consideration of how to best educate such students came even later. Francis Galton is given credit as the first person who looked at how high abilities are genetically passed down in his book, *Hereditary Genius* (Gallagher, 1994). In the United States, formal studies about high ability children were not conducted until 1925 under Lewis Terman. In 1922, Leta Stetter Hollingworth established the "Special Opportunity Class" in New York City for gifted students. Many studies of this particular class were conducted, which then led to numerous published articles and journals. This class was the foundation for The Speyer School, which she later founded in 1936. In 1926, Leta Stetter Hollingworth published *Gifted Children: Their Nature and Nurture*. This is considered the first textbook on gifted children (National Association for Gifted Children, 2018). Until then, there were many myths surrounding

such high ability children. Among those debunked included that they were: physically weak, socially maladjusted, or emotionally disturbed (Gallagher, 1984).

In public education, particular consideration for children with special needs occurred first in St. Louis in the 1880s and in Cleveland in the 1930s. The special needs of gifted students, though, did not emerge in public education until the 1950s, or what we call the “Sputnik Era” (Tannenbaum, 1983). The widespread concern that the Soviet Union was surpassing the United States in scientific fields prompted major curriculum reform throughout schools. The National Science Foundation and the U.S. Office of Education provided substantial funds for such initiatives (Goodlad, 1964). While these initiatives did not specifically target gifted children, the belief in the need to cultivate their talents was pervasive, and so actual practices within schools to do so became a focus (Tannenbaum, 1983). During this era, The National Association of Gifted Children was founded in 1954 under Ann Isaacs (National Association for Gifted Children, 2018).

In the 1960’s and 1970s, there was a notable shift in focus. American public schools started to look at how to provide more equity in their systems, and so programs for the gifted and talented moved out of the spotlight (Gallagher, 1984). It was not entirely left out of the vision for the future of American schools, though. In 1974, the Office of the Gifted and Talented was established within the United States Office of Education (National Association for Gifted Children). In 1989, the President and State Governors revealed “America 2000,” a long-term national plan to achieve certain academic goals (America, 2000). While much of the plan does focus on issues of equity, it also points out the need to develop the unique and special talents of children in order to develop future leaders of US

companies and institutions. *National Excellence: The Case for Developing America's Talent* was unveiled by the Department of Education. It listed recommendations for schools in educating America's gifted children (National Association for Gifted Children, 2018).

Defining "Gifted and Talented" / "Highly Able Learner"

There are numerous definitions of the term *gifted and talented*. The most accepted and widely used definitions by those in the education field are the ones used in federal reports. Take, for example, *The Marland Report*, which was commissioned by Congress in 1972. It included the first federal definition of "giftedness," and was then used formally by states. This particular definition focused on the idea of ability (Reiss & Renzulli 2004). The report stated:

Gifted and talented children are identified by professionally qualified persons as those who, by virtue of outstanding abilities, are capable of high performance.

These are children who require differentiated educational programs and services beyond those normally provided by the regular program in order to realize their contribution to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas:

1) General intellectual ability; 2) Specific academic aptitude; 3) Creative or productive thinking; 4) Leadership ability; 5) Visual and performing arts; and 6) Psychomotor ability (Marland, 1972).

The last tenet, “psychomotor ability” was later dropped from the list, as many felt that this item pertained more to athletic ability (Gallagher, 1984). In 1986, Renzulli offered a different definition, focusing instead on the idea of productivity rather than ability. It provided three key concepts, which includes: task commitment, above-average ability, and creativity. He highlights “gifted *behaviors*” rather than “gifted *students*” (1986). He provides this definition:

Gifted behavior reflects an interaction among three basic clusters of human traits above-average general or specific abilities, high levels of task commitment, and high levels of creativity. Persons who manifest, or are capable of developing, an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs (Renzulli & Reis, 1986, p. 218).

There is now an increasing popularity in using the term “highly able learners” or “high ability learners”. In 2012, the Sutton Trust of England issued the report, “Educating the Highly Able.” The report attributes the failure of numerous gifted and talented programs and initiatives to the ambiguity of that term. It states that it is simply too broad a construct upon which to develop effective policy. It explains that *gifted and talented* has evolved from connoting ‘intelligence’ to ‘gifted’ to then ‘gifted and talented.’ It further argues that ‘gifted’ and ‘talented’ are specific, citing the example that one gifted in mathematics may not be gifted in another area of academics and that “few top football players are also top artists” (Smithers & Robinson, 2012). Children may be considered “highly able” when: they are achieving significantly beyond the level expected of others their age in all areas of

learning, show a high level of achievement in a specific area or skill, and/or they show potential of demonstrating of high achievement in a particular area (Fogarty, 2017).

Today, “highly able learners” and “gifted and talented students” are often used interchangeably.

Characteristics of Gifted/Highly Able Learners

There is a consensus that a way to broaden one’s understanding of gifted/high ability learners and better cater to their educational needs is to understand their more general characteristics and exhibited behaviors. Table 1 below lists some of their cognitive traits while Table 2 outlines some of their affective traits. What is noticeable is that these students frequently have a very strong desire for in-depth learning of topics that interest them. They also demonstrate an ability to think about problems and issues in a more abstract manner than their peers. Many of these children are described as having intense or extreme emotional traits, and they can be more curious and demanding of their teachers and parents in their need to know about and understand topics of interest (Manning, 2006).

Table 1. Cognitive Characteristics of Intellectually Gifted Students

- Process and retain large amounts of information
- Comprehend materials at advanced levels
- Curious and have varied and sometimes intense interests
- High levels of language development and verbal ability
- Possess accelerated and flexible thought processes

- Early ability to delay closure of projects
- See unusual relationships among disciplines or objects
- Adept at generating original ideas and solutions to problems
- Persistent, goal-oriented, and intense on topics of interest
- Form their own ways of thinking about problems and ideas
- Learn things at an earlier age than peers
- Need for freedom and individuality in learning situations
- High desire to learn and seek out their own interests
- Abstract thinkers at an earlier age than peers
- Prefer complex and challenging work
- Transfer knowledge and apply it to new situations
- May prefer to work alone
- May be early readers
- May possess high energy levels and longer attention spans

(Clark, 2002)

Table 2. Affective Characteristics of Intellectually Gifted Students

- Possess large amounts of information about emotions
- May possess an unusual sensitivity to the feelings of others
- Possess a keen or subtle sense of humor
- Possess a heightened sense of self-awareness
- Idealism and sense of justice appear at an early age
- Develop inner controls early
- Possess unusual emotional depth and intensity

- Exhibit high expectations of self and others
- Display a strong need for consistency in themselves and others
- Possess advanced levels of moral judgment (Clark 2002)

These lists are far from exhaustive and comprehensive. They are tools to help educators more consistently identify their most able learners (Manning, 2006).

Identification of Gifted and Highly Able Learners

In 1905, Binet and Simon developed tests in order to identify children of inferior intelligence. Its purpose was to separate such children from their “normal” peers. This was a critical time in history, for it spurred the idea that intelligence could be measured by a single number. This measure became a widely used way to determine children of “inferior intelligence,” and so therefore also children of “superior intelligence” peers. The use of a single number to determine one’s intelligence or giftedness has now been abandoned (National Association for Gifted Children).

However, educational systems have still had major difficulty finding comprehensive ways of identifying gifted and talented learners. In the 1980’s, The U.S. Office of the Gifted and Talented commissioned a survey by the Educational Improvement Center-South. The findings indicated that there were many limitations in identification procedures being used at the time (Alvino, McDonnell, & Richert, 1981). The particular problems noted included lack of a clear definition and biased use of instruments and assessment procedures. Moreover, they found that special populations were underrepresented. A problem also mentioned is the lack of agreement in terms of what combined assessment tools and measure were preferable (MacRae & Luport, 1991). In another example, The Sutton Trust

Report found that accuracy was a major problem when schools in England were required to report the number of gifted and talented students. Percentages ranged from 0 to 100%. Very few students who were eligible for free or reduced meals were identified in this group. Subsequent interviews found that teachers were entirely unclear as to what constituted a gifted and talented child. Furthermore, schools used varied means of identification even though they all used the same tests (Smithers & Robinson, 2012).

Due to the many conceptions of giftedness, educational institutions must be clear about their definitions of giftedness and then create clear and comprehensive methods for identification. A perfect system for identification does not exist; instruments and tests will always contain some measure of error and bias. Moreover, the ways in which the data is interpreted and analyzed are also subject to error (Callahan & Hertberg, 2013). Callahan and Hertberg provide some guiding principles for educational institutions. The first is that the various pieces of a definition should lead to “independent, distinct identification procedures”. In other words, each part of giftedness should include tests, rating scales, observational checklists, etc. Second, identification should be flexible and ought to be able to be changed when new information is garnered. Third, procedures for identification should have multiple and specific means by which students can be considered at varying points in their educational career. The idea is that there needs to be various pathways by which students can enter this pool of identified children. Fourth, it is critical for schools to look at the standardized tests available and be familiar with how the data is normed. Schools must be able to defend the use of such a test (2013).

When identifying highly able girls, in particular, educators should bear in mind the range of behaviors often exhibited by gifted girls. Specifically, educators should look for discrepancies between: self-concept and performance; average or low test scores and exceptional originality, imagination and/or insights; a tendency to avoid participation despite signs of strong ability, misbehaviors in class that demonstrate leadership ability-even if those misbehaviors are disruptive; and stark contrast between school performance and abilities reported by adults (Davidson Institute 2008).

Gifted and Talented Education Curriculum Models

The Integrated Curriculum Model

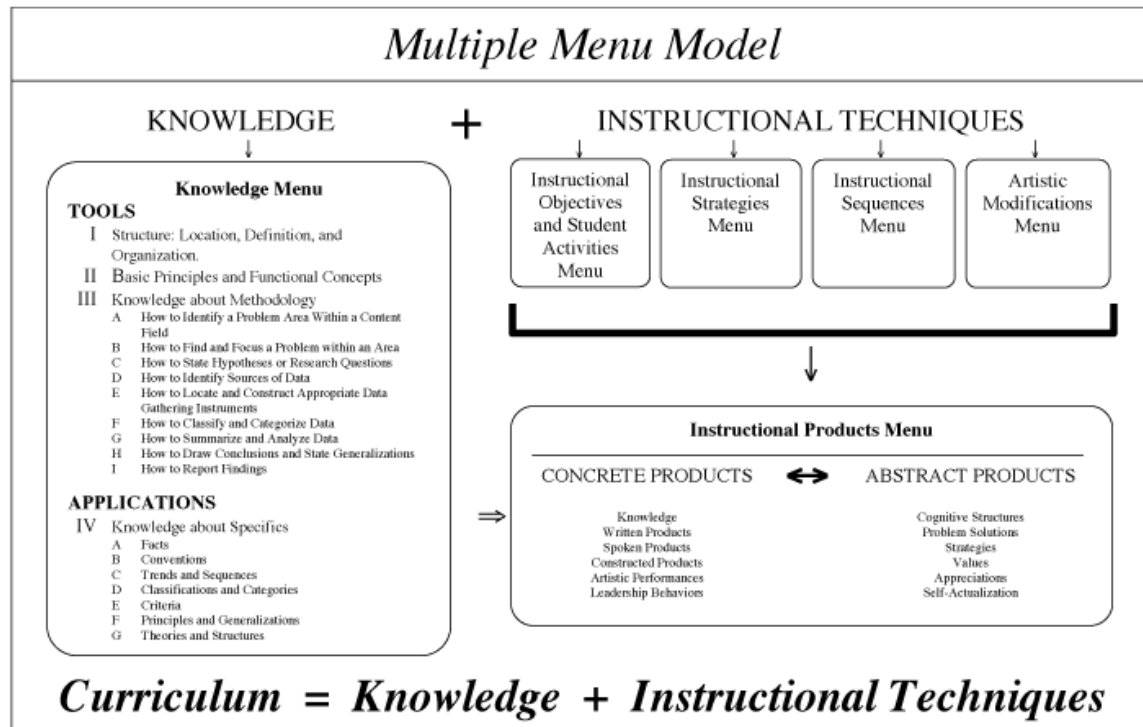
The Integrated Curriculum Model developed by VanTassel in 1986 is a widely adopted model and has been intensely researched. It was created with recommended approaches to gifted and talented education in literature in mind. It was also based on some general characteristics of gifted students, specifically: precociousness, intensity, and complexity. The model has three main components: 1) advanced content, 2) process-product and 3) concept/issues/theme. The “advanced content” component places emphasis on gifted students moving through material rapidly. The model’s “process-product” piece emphasizes in-depth and independent learning of concepts. It stresses higher-order thinking. The last dimension, “concept/issue/theme,” focuses learning on major real-world issues (Hockett 2009). The ICM framework allows for accelerated and compressed content, chances for students to develop complex products, activities based on student interest, as well as training in metacognitive skills (VanTassel-Baska & Little, 2003).

The benefits and successes of the ICM model are well documented in literature. For example, the study, “On Teaching Gifted Students- A Longitudinal Assessment of Gifted Students’ Learning Using the Integrated Curriculum Model: Impacts and Perceptions of the William and Mary Language Arts and Science Curriculum” found that students’ learning in grades 3-5 had been “enhanced at significant and important levels.” In addition, repeated exposure to the model showed strong increasing achievement. Stakeholders found the curriculum to be effective and beneficial in many ways (Feng, Baska, Quek, Bai, O’Neill, 2005).

The Multiple Menu Model

The Multiple Menu Model was devised by Renzulli in 1988. Diagram 1 below displays the model in diagram form.

Diagram 1. (Renzulli, 2000)



Renzulli's model is based on combined works of theorists in general education and gifted education. It utilizes six "planning guides." The foundational piece of the of the MMM is the Knowledge Menu. It requires a very close analysis of how a discipline is organized and structured, where it is placed in the larger context of knowledge, and what the primary concepts and principles are. The Knowledge Menu is a means by which students can explore big ideas and essential understandings of a discipline, participate in real-world activities and make strong connections among concepts through application. Four menus make up the Instructional Techniques component. The Instructional Activities and Student Activities Menu provide frameworks for how students will learn, analyze and apply knowledge. The Instructional Strategies Menu helps teachers to decide what techniques are most appropriate for teaching content. The Instructional Sequences Menu helps educators organize and sequence lessons. The Artistic Modification Menu allows teachers to make

curriculum more meaningful for themselves, and so therefore, their students by helping teachers to connect content to their own experiences and values. The sixth and last menu, the Instructional Products Menu, focuses on assessment and asks teachers to think about what concrete and abstract products will indicate student mastery (Hockett, 2009).

Parallel Curriculum Model

The main principle of this model is that good curriculum is one that serves students of all ability levels. The authors of PCM stress that there is not just one kind of gifted learner. There are four major parts to the PCM. Standards, principles, concepts, key facts and skills comprise the first part, the Core Curriculum. The second component is the Curriculum of Connections. The purpose for this piece is intended to help children find inter and intra-relationships among concepts and principles in various subjects. The third piece is the Curriculum of Practice, which allows children to practice and apply what they've learned to real-life situations. The last part, the Curriculum of Identity, enables students to see themselves reflected in what it is they are learning (Tomlinson, 2002). Along with these four parts are 10 "curriculum components" that authors of PCM believe to be important in creating effective curriculum. These include: content (or standards), assessments, introductory activities, teaching strategies, learning activities, grouping strategies, products, resources, extension activities and modifications for learners need. A distinct feature of PCM is its concept of "ascending intellectual demand (AID)." The premise of this is that all students must learn at their own pace and acquire knowledge when they are ready. In addition, students should be introduced to new concepts and skills at a level just slightly above what they are able to do independently (Tomlinson, 2005).

Autonomous Learner Model (ALM)

This model was developed by Dr. George Betts and Ms. Jolene Kercher in 1981 with input from students. It is one intended to serve the cognitive, emotional, social and physical needs of the “whole” gifted child. Its goal is to allow gifted children to become independent, self-initiated learners who are accountable for their own learning. The model attempts to teach students how to discover information on their own. It is designed with the intention of helping gifted students develop self-awareness; positive self-concept; thinking, decision-making and problem-solving skills. It is not intended just for academic success but personal development that enables children to become self-fulfilled adults (MacFarlane, 2018).

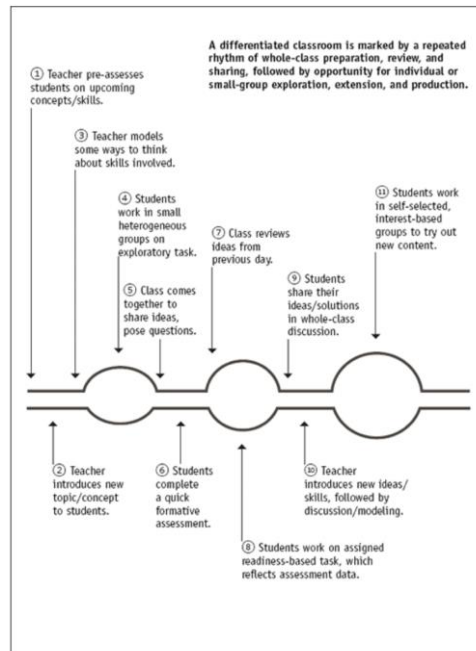
The first part of ALM is “Orientation,” which encourages the students to reflect on what intelligence is, how their school helps them to use their intelligence via various programs and methods, and then how they can play an important role in guiding their own future. Following this is the “Individual Development” stage. In this phase, students gain the tools they need to be independent learners. Teachers facilitate the acquisition of skills needed to obtain knowledge through research and technology, an understanding of university and career goals, and the organization strategies required to then accomplish their goals. Then comes the “Enrichment” phase, which can take on many different forms. Students can explore new ideas, investigate phenomena, take part in a cultural activity, engage in service work, or take a trip relevant to their interest. In this way, students can pursue knowledge based in real-world experiences. The next part of this model is called “Seminar.” These are not taught by professionals or teachers. Instead, students create seminars that show and demonstrate the knowledge and ideas they have gained during

their process. Often, students work in small groups during this phase. The last stage of ALM is “In-Depth Study”. It can mean an individual or group project, a presentation, an assessment, or even a mentorship. This is considered the highest level of autonomous learning, for it is the stage in which students synthesize the information, skills, and strategies they have learned to demonstrate what they have learned on their own. Teachers can use a full cycle of ALM cycle with their class or just a specific group of students. Teachers can also choose to focus a lesson on one aspect of the model (Betts, 1986).

Differentiation Model

In its simplest form, differentiation means “changing up” what transpires in a classroom so that students have choices and different opportunities to take in information, make sense of concepts, and express what they understand (Tomlinson, 2004). Differentiation is proactive, rather than reactive. Therefore, a critical component of differentiation is assessment, and not just summative assessments to determine which students understand an entire unit. The consistent use of diagnostic pre-assessments and formative assessments are an integral part of differentiation so that the teacher can tweak and adjust lessons to meet the varying needs of students in the classroom. Differentiation is a blend of whole-class, group, and individual instruction. Diagram 2 below shows the ways in which a differentiated class may operate.

Diagram 2. (Tomlinson, 2004)



The idea is that while teachers may know more about their subject matter, they are constantly learning about how their students learn best. Therefore, ongoing collaboration and check-ins with students are needed in order to refine learning opportunities. At its core, differentiation takes multiple approaches to content, process, and product (Tomlinson, 2004).











Kaplan's Depth and Complexity Model

Sandra Kaplan developed this model in 1996 following ample research into what types of knowledge an expert had within a particular field versus someone with only surface-level understanding. Expert knowledge can be categorized in two ways – depth (i.e., deep understanding of the content of the field) and complexity (i.e., scholarly insights into the connections across time, people and disciplines.) Deep understanding comes with investigating language, details, patterns, rules, trends, unanswered questions, ethics, and

overarching ideas which form the content of the topic. Complex understanding is achieved by discovering how the topic has changed over time, understanding different perspectives of various constituents, and how the topic connects with other disciplines. To help teachers and students to readily identify the types of thinking needed, Kaplan created a set of “icon prompts” to accompany “tools”. Each icon prompts students to think about a particular topic in a certain way. For example, if students see the black and white diamond symbol, it prompts them to explore the ethical dilemmas of the particular issue. Diagram 3 shows some of the tools and symbols (Byrdseed, 2019).

The idea is that the prompts help students move closer toward “expert knowledge”. For example, a teacher may start with the question, “Compare and contrast Lincoln and Washington.” A better prompt might be, “Compare and contrast the ethical dilemmas Lincoln and Washington faced.” By changing this question using the model, students will be asked to discover and demonstrate deeper and more complex knowledge (Byrdseed, 2019).

Diagram 3. (Byrdseed 2019)

-  Big Idea – An overarching idea about a topic.
-  Essential Details – The most important specifics about a topic.
-  Language of the Discipline – The vocabulary an expert would use within this field.
-  Rules – The laws, hierarchies, norms, etc within a topic. Breaking these often have a consequence.
-  Patterns – Expected repetition within a field. These can break without dire consequences.
-  Ethics – The problems, ambiguities, or dilemmas of a topic.
-  Trends – How a topic is currently changing and what forces are causing those changes?
-  Change Over Time – How has a topic changed over long periods of time?
-  Multiple Perspectives – How do different people view this topic?
-  Across Disciplines – How does this topic represent an intersection of other fields.

Effective Practices in Designing Educational Programming for Gifted and Talented Students

First Steps

Given the various definitions of “gifted and talented” and “high ability learner”, schools should, first and foremost, have a common understanding of what the term(s) mean among its community members. The development of thorough and comprehensive identification procedures used to assess giftedness are then necessary. These two components should directly guide the kinds of programs, curriculum, instruction, and supporting resources provided to gifted students. As well, they should guide the professional development provided to faculty. The school should ask itself: Can different constituents of a school (parents, students, teachers, etc.) articulate the desired outcomes of the gifted programs provided? (Callahan, Renzulli, et al., 2013)

Assessment

Effective differentiation necessitates the use of pre-assessment to understand where students are in relation to the goals of instruction. It also requires the use of formative assessments in order for teachers to be able to make adjustments to lesson plans and instruction. Lastly, it also requires the use of summative assessments as key endpoints (MacFarlane, 2018). All assessments must be analyzed to see if they appropriately support gifted and talented students. An educator should ask whether or not students who learn quickly are allowed opportunities to show their growth in knowledge or skill after instruction is given. Gifted and talented children who may not understand a concept during a pre-assessment will often pick up the concept quickly in relation to their peers.

When using summative assessments, there are three aspects that are important to consider: 1) content validity (whether an assessment is actually measuring what it is supposed to measure), 2) ceiling effect (describes the tendency for assessments to limit opportunities for students to really show the extent of their knowledge), and 3) interrater reliability (describes the consistency of assessment results if different people grade the assessment) (MacFarlane, 2018).

Acceleration

Acceleration has been widely researched and has proven to be cost-effective as well as highly beneficial for gifted and talented students (Colangelo, Assouline, Gross, 2004). There are many forms of acceleration such as concurrent (or dual) enrollment, subject-matter, curriculum compacting, and self-paced instruction. Concurrent enrollment allows high school students to be simultaneously enrolled in college courses and earn college credits. Subject-matter acceleration is when higher level materials are provided to learners at earlier stages. It is then often used with compacting, in which less time is spent on basic information so that the student can engage in more in-depth and complex activities (MacFarlane, 2018). Self-paced instruction allows students to learn at their own rate. Its implementation looks quite different from one setting to the next. It may include independent study or projects as well as skipping a grade level. The use of this particular kind of acceleration is often frowned upon in schools. Educators tends to believe that skipping a grade can have negative social effects for a learner. Many believe that a child may not be mature enough socially or emotionally to be with older peers. However, there is

ample cognitive and learning research that suggests that students should not be limited to stages marked by chronological years or grade levels (MacFarlane, 2018).

Grouping

Grouping is another strategy used for gifted and talented learners. Clustering and mentor grouping are two specific models often used in schools. Cluster groups are when 3-8 students with similar abilities are put together in a mixed-ability classroom. It is a fluid method in which learners can be grouped and regrouped. Mentor grouping can serve different goals. It can be a group of learners that have the same challenges as one another, and a mentor can give strategies to help them be successful. Another possibility is for learners to participate in communities centered around interests and passions (MacFarlane, 2018).

Enrichment

Enrichment can include activities or projects during the school day or after school. Things like clubs can cater to student interests or passions as one form of enrichment. Clubs can run the gamut and vary. Some may include: physical activities, service-learning projects, dance, photography, coding etc. A chance to compete is also a valid and engaging way to enrich content (such as spelling and geography bees, debates, dance performance competitions, etc.) (MacFarlane, 2018).

Social-Emotional Support

Social emotional support is considered important in educating the “whole” gifted child due to the relationship that exists between talent development and social emotional development. Research suggests that when the two are addressed together, achievement is bolstered (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Individual and group counseling, life and study skills training, mentor programs, support programs led by mental-health professionals and support in seeking college opportunities are some ways that schools can support the social and emotional needs of students and increase positive academic self-concept (MacFarlane, 2018).

Technology Use

Technology provides students with the opportunity to communicate with mentors who have similar passions and interests across the globe. They can form connections with people in fields of interest before graduating, as well as develop a reputation before even entering the workforce (MacFarlane, 2018). According to research, gifted and talented students who participate in advanced courses via distance education report satisfaction and success with such programs. Technology permits students access to various programs and opportunities that they may not otherwise have for various reasons- such as geographic or school option limitations (MacFarlane, 2018).

The Arts

In the past, state and federal gifted education policies have centered mostly around services for the academically gifted rather than the creatively gifted (MacFarlane, 2018). However, quality fine and performing arts programs consistently correlates with positive

outcomes in a number of ways for students: metacognitive processes, social-emotional development, habits of mind, and academic achievement (Duma & Silverstein, 2014). The chances for students to engage in creative curriculum, both in traditional (e.g., music, creative writing, inventions) and nontraditional ways (e.g., competitions, problem solving, critical thinking) promotes creativity (MacFarlane, 2018). Teaching creativity helps students strengthen problem solving and critical thinking skills, as well as other forms of “imaginative expression”, such as the ability to persist in achieving a goal (MacFarlane, 2018).

Status of Middle School Programs for the Gifted in the United States

Callahan, Moon and Ho conducted a study in 2017 to discover the current status of practices and procedures in gifted education in public schools in the United States. It also sought to discover the extent to which the National Association of Gifted Children (NAGC) Pre-K- Grade 12 Gifted Education Programming Standards are used by schools when planning their gifted and talented programs. They sent out leveled surveys (elementary, middle, and high schools) and received results from 1,566 respondents in separate school districts.

The definition of “giftedness” can vary state to state, but the greatest number of states include these areas of giftedness: intellectually gifted, academically gifted, creatively gifted, specific academic areas, and/or performing/visual arts. The study revealed that at the elementary level, the most common recognized domain of giftedness was intellectual giftedness (Callahan, Moon & Ho, 2017). The average reported percentage of students identified as gifted at the elementary level was 7.8% (SD=6.5%; range=0%-50%). District

coordinators (62% at middle school level and 57.9% at high school level) reported that between 1% and 10% of the students in their districts were identified as gifted. 81.4% of the respondents at the middle school level reported that there was a specific process in place for identifying gifted and talented students. Remaining respondents said that the district did not identify gifted students at the high school or middle school level because eligibility for such programming was dependent upon previous identification.

The most common identification of such students at the middle and high school levels came from student nomination from teachers, parents, school administrators, counselors, student peers, or students themselves. At the middle school level, fewer than 10 respondents cited universal or general testing. The CogAT and the ITBS tests were the most commonly used instruments in the general screening process. 83.5% of district coordinators reported offering opportunities for gifted students that were different than the regular classroom curricula as a program goal. However, in responding to questions about the goals of gifted programming, respondents more frequently referred to goals relating to processes (e.g., providing teacher training and increasing identification of underrepresented groups) (Callahan, Moon & Ho, 2017). 40.2% of middle schools reported that their district did not adopt any specific framework to guide gifted programming. Those that did, though, reported the use of Tomlinson's (2001) differentiation model, Renzulli's Enrichment Triad Model (1977), and Kaplan's Depth and Complexity Model (2005) (Callahan, Moon & Ho, 2017).

57.6% of the districts at the middle school level reported receiving fewer than 5 hours per school year of professional development activities focusing on meeting the needs

of gifted and talented students. Strategies for differentiation for gifted students were the most notably used when provided professional development. Less than 50% of districts at the middle school level reported program evaluation to assess the effectiveness of gifted and talented program services.

In all, the researchers drew a number of conclusions about the status of gifted programming in the United States, particularly in the middle school years. First, gifted and talented programs do not “operate from a base of strength within the individual components as delineated by the literature or by the NAGC Standards” (Callahan, Moon & Ho, 2017). Generally speaking, districts do not use a clear set of goals grounded in student learning outcomes in implementing gifted and talented programs. The frequent use of just one model goes against the research findings that a continuum of services is best in meeting the needs of this population of students. Lastly, professional development that prepares educators well for meeting the needs of high-ability learners is also limited. The researchers state, “...our data strongly suggest that gifted programs, in many instances, are not providing the types of services necessary to contribute significantly to the academic, social, and emotional development of gifted youth” (Callahan, Moon & Ho, 2017).

History of the Education of Girls and Women

At the end of the 18th century, most boys in colonial America went to “dame schools”, which were schools that emulated the English model of home instruction in which small groups of children were taught in the kitchen by older women in their homes. It was during this time that women established themselves as teachers in colonial America (Madigan, 2009). Dame schools were responsible for preparing boys for town schools, or

academies (Monaghan, 1988). Girls were not permitted to attend such academies up until the 19th century. When they were finally allowed to do so, they had to come at different times of the day than the boys or on days when boys were not in school, such as the summertime or holidays (Madigan, 2009).

During the growth of the coeducational public high school system in the 1800s, there also began a single-gender seminary and academy movement. Catherine Beecher, Emma Willard, and Mary Lyon were among the leaders to push for the moral, literacy and domestic education of young women (Madigan, 2009). The Catholic Church played a critical role in this movement, for the number of Catholics had increased to 3 million by 1860, which fueled the desire and need for church-sponsored education. Seminaries served to train teachers and promote innovative teaching methods of the time (Sadker & Sadker, 1995). This entire academy movement gave rise to the first women's colleges in the United States such as Georgia Female College, Mount Holyoke Seminary, and Elmire Female College (Madigan, 2009).

In the western territories during the mid 1800s, co-education was more viable in terms of economics because of the limited number of people inhabiting the area. This was not the case in the eastern areas, where there were already strongly-established, single-sex institutions that were financially secure. Affiliates to these institutions began to arise, and such affiliations with places like Harvard, Columbia and Brown allowed women to participate, albeit in a limited way, in the education provided by such prestigious schools. Women remained closely supervised and segregated from men. At the end of the 19th century, some state universities permitted women to enroll in degree programs, although

private universities did not. As a result, schools like Smith, Wellesley, Barnard, Vassar and Bryn Mawr were established to give women a chance to attend universities in which they could pursue their areas of interest (Madigan, 2009).

At the beginning of the 20th century, most public secondary schools and colleges had become co-educational. However, coeducation environments did not insure equal opportunity. In 1918, the Commission on the Reorganization of Secondary Education argued for a two-track system. One track provided a pathway for students, particularly males, toward college preparatory courses while the other track provided vocational training. Girls, no matter their talents, gifts or achievements, were most often pushed to pursue things like domestic science or home economics (Tyack & Hansot, 1990). Through the mid 1960's, women's roles in the workforce remained limited to: secretarial work, nursing, teaching or motherhood (Sadker & Sadker, 1995). The Women's Educational Equity Act was passed in 1974, and support was given to help schools actively recruit girls for careers in math, science and athletics. With this act came some awareness about gender bias, and teachers were actively taught about its impact and pedagogy. In the 1980's funding for this act was cut dramatically (Madigan, 2009).

Gendered Practices

An article published by Psychology in the Schools in 2012 and the Davidson Institute provide characteristics that are specifically common to high-ability girls. In early childhood, high-ability girls tend to be voracious readers, and they are able to retain what they read. They are highly verbal, with an advanced vocabulary (Kerr, Vuyk & Rea, 2012). As such, they are able to communicate clearly both verbally and in writing. At an earlier age

than their peers, they can see issues from multiple points of view (Davidson Institute). Since creatively gifted girls may push back on requests to stay on-task, they may be improperly or prematurely diagnosed with ADHD (Webb et al., 2005).

By middle childhood, highly able girls' self-esteem is high- and they tend to work hard on projects that interest them. It has been found that often, these projects are not provided in school, and so these girls may have to find such challenges outside of the school environment. To combat boredom, some of these girls will daydream or push aside schoolwork for more intellectually challenging pursuits. The quiet, gifted girl may even be labeled depressed (Kerr, Vuyk & Rea 2012). Girls who do follow directions, are compliant, quiet, and do not disrupt the classroom may be entirely overlooked and not provided opportunities they need to nurture their skills (Sadker & Sadker, 1995).

Preadolescence is the time when most people tend to recognize gifted girls' talents. However, the pressure to be pretty and popular can be very constricting for girls at this age. They may surrender to the stereotypes and stop participating in activities they once enjoyed (Kerr, Vuyk & Rea, 2012). Creatively gifted girls are more prone to experiment as a way to fulfill their need for experimentation. There is some evidence to show that high intelligence may be linked with higher drug use in adulthood for women (White & Batty, 2011).

In adolescence, gifted girls can have significant accomplishments, yet those do not necessarily translate in the workforce when they become adults. This is because career choices are gendered. In a study with 92 high school valedictorians in 2008, York found

that girls chose colleges that were less elective and careers that paid less than boys and selected careers in STEM less than boys.

Barriers for High-Ability (Female) Learners

There are some behaviors that highly able learners can exhibit that teachers may find disconcerting. However, it is critical for educators to fully recognize and analyze such behaviors in context. Highly able learners may have trouble finishing assigned work because of the lack of opportunity to really study a particular area of interest. It could also be that the student knows the material well and feels no need to practice and do homework related to the topic (Manning, 2006). Some children may exhibit challenging or seemingly defiant behaviors because they are bored. It is possible that their high abilities have not been identified. Acting out can be a form of attention-seeking, and negative attention can be preferable to being overlooked (Fogarty, 2017).

Highly able learners may have trouble forming positive relationships with peers. For some children, being labeled “smart” or “clever” may be socially isolating. They may be unable to relate to their peers and could be ostracized by them or choose to isolate themselves (Fogarty, 2017). Sometimes, such students do not perform well in collaborative groups. They may feel that the burden is on them to complete a project, and therefore, prefer to work alone. In such groups, being labeled “bossy” by peers may actually be a situation in which the highly able learner is actually practicing his/her leadership skills or exploring how to lead effectively. Some of these learners may work at a much slower pace than their peers, with a desire that their work is completed to perfection (Manning, 2006).

Another barrier for such learners is that they may fear failure. For such students, learning can come quite easily. The praise that accompanies this from adults may be how they define themselves. Therefore, they may be unwilling to take on certain challenges for fear of failure. They may feel that they will no longer be perceived as “smart” or “intelligent” (Fogarty, 2017). It is also possible that emotional outbursts or withdrawal of such students is due to their higher levels of sensitivity than their peers (Manning, 2006).

One challenge specific to girls is that they are more susceptible to the bombardment of media messages because girls use more media than boys (Smith, Kennard, & Granados, 2009). As such, girls are socialized to believe that appearances matter more than intellect, and they are then taught to hide or downplay their intelligence (Smith et al., 2009). For example, JC Penney had t-shirts that said, “I’m too pretty to do homework so my brother does it for me,” and “My best subjects: Boys, shopping, music, dancing.” One of the very first talking Barbies would say, “Math class is tough!” (Sauers, 2011).

Girls tend to have lower self-esteem than boys during their schooling years, and they are more prone to develop a sense of apathy or feelings of inferiority. Because of more pressure to appear “perfect,” they may be less likely to take risks for fear of failure or seem apathetic about their own talents (Davidson Institute, 2018).

Single-Gender Classes in Coeducational Schools

Single-gender classes have been implemented in a number of coeducational settings with the intent of promoting female involvement in STEM areas. For example, in South Carolina, the single-gender option is quite prevalent. In 2010, the state had over 160

schools offering that option, which, at the time, was more than any other state in the United States. Single-gender classes were offered in kindergarten through 9th grade in urban, rural and suburban districts across the state (Chadwell 2010). Studies have found mixed results as to whether or not single-sex classes result in higher test scores in STEM areas (Rosenthal, London, Levy, & Lobel, 2011). However, what research amply supports are the positive social outcomes and perceptions of experiences of girls in single-sex classrooms. A 2011 study at a university in the Northeast examined two theoretically-guided predictors of women's sense of belonging in their STEM majors as well as general belonging within the university (Rosenthal, London, Levy, & Lobel, 2011). The multiple regression analyses supported the hypotheses that for women in STEM courses of study in their first year of college, "perceived identity compatibility, support from others and support from the single-sex program were each independently associated with greater sense of belonging in their major" (Rosenthal, London, Levy, & Lobel, 2011).

A study using a phenomenological design was conducted in 2016 that examined the lived experiences of seven middle grade students- four females and three males who were enrolled in a single-sex mathematics classroom within a coeducational public school. The study sought to understand, from the students' perspectives, their lived experiences in this class (Simpson & Che, 2016). The study revealed that the students did not "foreground the academic discipline under study" but rather almost entirely focused on the social aspects of the classroom experience. This demonstrates the need for schools to consider non-academic classroom aspects as it pertains to single-sex education rather than putting too much focus on academic achievement and/or the differences in the ways boys and girls learn. The girls described an appreciation for single-sex classes that were lacking in the

boys' descriptions. Girls indicated that they felt less distracted without the boys. The boys, on the other hand, indicated that they felt more distracted in their all-boys class. The girls indicated that they felt far less concerned about their outward appearance- an issue that the boys did not raise. The females further expressed a sense of "mathematical freedom" in their single-gender settings and felt more comfortable asking and answering questions. This aspect, too, was not mentioned by the boys in their statements. The researchers conclude that the experiences of students in single-gender classes at the middle school level may actually rely more on the co-constructed social norms of the class and a sense of community brought about by teacher-students and student-student relationships rather than in the connection to the academic discipline (Simpson & Che, 2016).

Another qualitative study was conducted by Hart in 2016. The researcher collected data over a three-year period at one school site. Participants in the study indicated that 6th grade students who were placed in the single-sex classroom felt that the setting was more supportive than a mixed-class setting. The students felt that they were more focused and engaged with the material studied. They also felt less social anxiety (Hart, 2016).

The All-Girls School Option

Dustmann, Ku, and Kwak, in a study of schools in South Korea, found "robust evidence" that students in single-gender schools outperform their counterparts in coed schools (2018). Furthermore, they also discovered that there is much evidence that supports that academic achievement decreases when single-gender schools convert to coeducational institutions. In 2010, Trinidad and Tobago converted 20 low-performing high schools from coeducational to single-sex. In 2016, Jackson analyzed the data gathered

from these schools between 2006-2012. He sought to identify “the causal effect of single-sex schooling holding other school inputs constant “. After accounting for student selection, he found that single-sex cohorts scored higher on national exams and were four percentage points more likely to finish high school. In addition, all-boys cohorts had fewer arrests as teenagers and girl-cohorts had fewer teen pregnancies (Jackson, 2016).

Using data from the High School and Beyond study and multinomial logit analysis, a 2003 study found that women who attended all-girls’ high schools (versus coed high schools) were more likely to major in sex-integrated fields, compared to fields where a majority of people are women. The study found that the effect may be due to feminist attitudes prevalent in an all-female high school environment but is not due to differences in coursework (particularly math) or test scores (Thompson, 2003).

Using data from the Freshman Survey conducted by the Higher Education Research Institute at the University of California, Los Angeles, researchers used multilevel analyses to separate the effect of an all-girls education from other influences such as socioeconomic status, race, ethnicity, and parent education. The findings were consistent- graduates of all-girl high schools were more engaged, both socially and academically, than their peers who came from coeducational settings. The researchers concluded that when compared to their female peers at coeducational schools, students from all-girls schools had stronger academic skills, were more academically and socially engaged, had higher self-confidence in science, demonstrated higher levels of cultural competency, engaged in more service learning, and had higher levels of political and civic engagement (Riggers-Piehl, Lim, & King, 2018).

CHAPTER 3

Introduction

The purpose of this qualitative study, using multiple case studies, explored: how independent school teachers characterize their high-ability girls; the practices/procedures that independent schools employ to identify their high-ability middle school girls; the resources, structures, and supports in place to meet high-ability girls' academic needs; and training in instructional practices and professional development provided to teachers to educate about high-ability girls' academic needs.

Independent schools are fiercely autonomous entities and do not have to respond to the education laws and requirements of public schools (Kane, 1992). This includes federal and state mandates about reporting and providing programming for gifted and talented students. Since independent schools have so much freedom in selecting its students and allocating resources to particular areas, they are more able to focus explicitly on the needs of high ability (specifically, high ability *female*) learners should they so choose. The question is whether or not this is actually an area of focus for any of these independent schools, and if not, to understand why.

This study looked at the approach of co-educational independent schools in regards to the following questions: a) How do independent school teachers characterize their high-ability girls? b) How do independent schools identify their high-ability middle school girls? c) What resources, structures, and supports do schools provide for high-ability girls'

academic needs? d) What training in instructional practices and professional development do schools provide to teachers to educate about high-ability girls' academic needs?

Design

This was a qualitative, exploratory study. Since case studies are often used in exploratory research (McLeod, 2014), this utilized the case-study approach. Cross-case analysis approach of four cases were used in order to examine data from several participants from each site who shared the experience of teaching middle-school students (grades 6-8). This method enables a case study researcher to explore a combination of factors that may contribute to the outcomes of a case. This helped to make sense of confusing or unique findings, as well as to further explain concepts, hypotheses or theories that were discovered (Gerring, 2004). Furthermore, it shed light on various aspects of human thinking and behavior that is unethical to capture in other ways. It allows for the generation of new ideas and illustrating theories (McLeod, 2014). Since this study included the examination of perspectives, a semi-structured, open-ended interview was an appropriate method to capture the accounts of participants.

Sampling

In order to investigate the research questions (i.e., how independent school teachers characterize their high-ability girls; the practices/procedures that independent schools employ to identify their high-ability middle school girls; the resources, structures, and supports in place to meet high-ability girls' academic needs; and training in instructional practices and professional development provided to teachers to educate about high-ability

girls' academic needs), I used a criterion-sampling approach so as to obtain qualified candidates who provided the most credible information (Turner, 2010). I interviewed four teachers in four non-denominational, coed, independent schools, for a total of 16 interviews altogether. All schools selected were accredited by the National Association of Independent Schools and self-identified as college preparatory. Tuition for each of the selected schools was about, or slightly above, \$40,000.00 per student per year for grades 6-8. Teachers who taught across disciplines in grades 6-8 were interviewed. In each school, at least two people in the science, math, and/or technology departments and at least one in the English/history department were interviewed. I used my professional network to contact and identify schools that met these criteria. Each teacher who was interviewed was assigned a number to ensure anonymity. The researcher asked for gender ratios of students for each school. She asked from the school the number of female administrators and male administrators to include in the final report.

Profiles of Schools

School A

School A is a co-ed school in New York, New York. It was established in 1919 by a woman. It houses grades K-12. The school has 1,300 students. The average class is 13 students, with a student to faculty ratio of 7:1. The tuition is \$51,350.00. There are 250 faculty members, and 87% hold advanced degrees. The Head of School is male, and the Head of Middle School is female, and the Head of Lower School is female. 12 members sit on the Senior Administrative Team, 6 are female; 6 are male. The Chairman of the Board is male.

School B

School B is a co-ed school in Morristown, New Jersey. It was established in 1891 and houses grades 6-12. Three males founded one school in 1891, and three females founded another school in 1891. The two schools merged in 1971. It has a total of 575 students with 140 students in grades 6-8. The average class size is 13 students and the student to faculty ratio is 7:1. The tuition for middle school is about \$40,610.00. There are 92 faculty members, 72% of whom hold advanced degrees. The Head of School is male, the Head of Middle School is female, and the Head of Upper School is male. Thirteen people sit on the senior administrative team; 6 are female, and 7 are male. The Chairman of the Board is male.

School C

Elisabeth-Morrow School is located in Englewood, New Jersey. The founder was a woman who established the school in 1930. It now houses grades K-8 and has 430 students. The average class size is 15 students, and the tuition is \$41,400.00. There are 130 faculty members, 72% of whom hold advanced degrees. The Head of School is female, the Head of Middle School is male, and the Head of Lower School is female. 7 people sit on the senior administrative team. 6 are female, 1 is male. The Chairman of the Board is female.

School D

School D is located in Bedford, New York. It was established in 1917 by six women. It now houses grades Pre-K-9 and has 400 students. The average class size is 16 students, and average tuition for middle school is \$42,400.00. There are 82 faculty members, 78% of

whom hold advanced degrees. The Head of School is male, and the Head of Middle School is male. 8 people sit on the senior administrative team; 5 are females; 3 are males. The Chairman of the Board is male.

Data Collection

This study used in-depth interviewing as its primary method of data collection as well as observations and field notes as a secondary method of data collection.

In-Depth Interviews- Primary Method

An open-ended inquiry approach was employed to gain clarity about teachers' perceptions of high ability female learners, how and/or if the school has: has a process in which to identify such learners, structures and systems to support these students' academic and social/emotional learning needs, and professional development surrounding this population of students. The use of in-depth interviewing and open-ended questions allowed participants to use their own frame of reference when answering questions. Participants had the ability to narrate their experiences in, and perceptions of, their schools (Bogdan & Biklen, 2007).

Before the actual interviews, the researcher implemented a pilot-test, which was an important piece of the interview preparation. This allowed the researcher to identify flaws and weaknesses of the interview design and to make revisions before implementation of the research study. The pilot-test illuminated the need for a revision of the questions asked, as they must follow certain criteria in order to be deemed effective: 1) wording of questions must be open-ended, 2) questions should be as neutral as possible, 3) questions

must be asked one at a time, 4) wording must be clear (Turner, 2010). Follow-up questions and probes were used to elicit additional details, clarification and elaboration on topics relevant to the study (Bogdan & Biklen, 2007). Questions also included follow-up ones. The pilot test was conducted with respondents with similar background as those selected for the study (Turner, 2010). Fellow school leaders tested the reliability of the interview questions to ensure that they produced useful data.

The researcher abided by a few other major principles that mark high-quality qualitative research. This includes that: 1) each participant will feel relaxed and open so as to be able to address the topic in a meaningful way and 2) the researcher be flexible in responding to the immediate situation presented to her rather than following a rigid script or set of procedures (Bogdan & Biklen, 2007). To achieve this, the interview started with a “soft-ball” question that permitted the respondent to describe his/her professional background (e.g., years of experience, description of the department in which he/she is part, current role, etc.) In this way, the respondent was made to feel like an “expert”. In addition, the researcher employed active listening skills via probing questions that will advance the participants’ responses. The establishment of trust through deep listening allowed for the gathering of more accurate data (Bogdan & Biklen, 2007).

Observations and Field Notes- Secondary Method

The researcher collected and observed artifacts from each participating school. Specifically, the researcher asked for: curriculum guides, course-offering pamphlets, admissions marketing materials, descriptions of advanced classes, and club offerings. If the school did, indeed, have an identification process for gifted and talented students, she

asked for the breakdown of number of students and by gender. In observation of such artifacts, the researcher looked for: identification procedures of gifted and talented students, specific programming that caters to high-ability (female) learners, how the school discusses the ways in which it meets the needs of its high-ability students, and the existence (or nonexistence) of single-gender classes. The researcher sought to discover and understand how a higher or lower percentage of females in the faculty and/or leadership might influence the systematic programming for high-ability female learners. The researcher took field notes, which is descriptive information about what the researcher directly heard or saw on-site (Kawulich, 2012). Some schools display photos of students in various classes or post listings of who belongs to specific clubs/activities. At MKA, for example, there are posters placed around the school that show members of the Laptop Leadership Program. There is a screen with revolving photos of various sports teams. Such descriptions can provide a fuller picture of the ways in which independent schools may cater, both directly and indirectly, to high-ability female students. These field notes were taken on-site and right after having left the site. The researcher avoided opinions and adjectives to describe what she saw. The date, site, time and topic were included on every set of field notes. Lastly, the researcher listed key words associated with observations. The field notes were separated into two categories: descriptions and then reflections. The researcher wrote down hunches, questions and insights immediately after each observation and wrote memos as to what she thought might be happening (Kawulich, 2012).

Table 1 below connects the study's research questions with corresponding interview questions.

Table 1.

Preliminary questions:

- Tell me about your position here.
- What do you teach? What are your main responsibilities? What is your educational background?

Research question	Corresponding interview question
How do independent school teachers characterize their gifted and talented girls?	<ul style="list-style-type: none">• From your experience as a classroom teacher, what have you found to be some of the general characteristics of high ability female learners (or gifted and talented girls)?• How do these characteristics differ than high ability male learners?
How do independent schools identify their high-ability middle school girls?	<ul style="list-style-type: none">• How does the school identify students with gifts and talents in the various academic areas? Within your discipline?• What are the means, if any, by which student needs are shared among faculty and staff, particularly those who are deemed “gifted and talented”?
What resources, structures and supports do schools provide for high-ability girls’ academic needs?	<ul style="list-style-type: none">• By what means can gifted and talented girls pursue areas of interest?• How does the school respond when informed that a student does not appear challenged enough- by either a parent or student?• How do lessons created within your discipline/department cater to the wide range of learners within the classroom?
What training in instructional practices and professional development do schools	<ul style="list-style-type: none">• What have been some of the main foci of professional development for

provide to teachers to educate about high-ability girls' academic needs?	<p>your faculty in the last 1-2 school years?</p> <ul style="list-style-type: none"> • What are some of the professional development workshops/conferences that you've attended the last 1-2 years? • In what ways, if any, have these professional development opportunities/conferences helped you to better cater to gifted and talented girls?
What are the barriers to catering to highly able female learners?	<ul style="list-style-type: none"> • What do you feel are some of the challenges in catering to high-ability female students in your school?

Data Analysis

Particular steps were followed when creating coding categories from the interview data. In the first step, transcripts were read for accuracy and coherence. While reading, the researcher wrote a preliminary list of potential coding categories. Open coding was used at first in order to organize the data into chunks to help interpret meaning and identify congruence among participants. In the next step, the researcher assigned and categorized codes to identify emerging themes. This was done by looking at comparisons and identifying patterns among responses. Once the coding processes were established, a formal feedback loop was created by sharing reflections with peers. After the coding and categorizing parts were done, memos were written to make the researcher's line of thinking visible. This also helped the reader to interpret the codes and categories. The data

was interpreted via explanation of the most salient aspects of the study as well as the lessons learned. Connections about the findings in relation to other literature and relevant theories were made (Bell, 2017). In the final step, the researcher was able to identify possible implications for gifted and talented programming specific to females. Illustrative quotes and examples provided by participants are shared. Below are some coding themes that were discovered.

Organizing Themes/Codes

8. Perceptions of high-ability female learners
9. Identification procedures for gifted and talented students
10. Methods and practices
11. Barriers for female learners
12. Professional development
13. STEM opportunities
14. Extracurricular options

Summary

Four major, overarching questions guided this exploratory research, employing the use of case studies:

- 1) How do independent school teachers characterize their gifted and talented girls?
- 2) How do independent schools identify their high-ability middle school girls?

3) What training in instructional practices and professional development do schools provide to teachers to educate about high-ability girls' academic needs?

4) What are the barriers to catering to highly able female learners?

This research study used in-depth interviews as its primary method of data collection, and observations and field notes as its secondary method. Since research demonstrates that middle school is the time in which high-ability female learners' interests significantly wane, interviews of independent, middle school teachers were conducted. There is a lack of existing literature specific to independent schools. What little research exists on this topic has been conducted in the public sector. However, the focus of much research is on the reasons why high-ability girls' interests and talents wane, and not what schools at large are doing to prevent and/or address this from occurring. This research study aims to contribute to the larger picture and understanding of educating our high-ability female students in today's society.

Chapter 4

RESULTS AND FINDINGS

Introduction

This chapter presents the results and findings from the study. The purpose of this qualitative study is to explore how coeducational independent middle schools are meeting the academic needs of their most highly able girls. The research questions include: a) How do independent school teachers characterize their gifted and talented girls? b) How do independent schools identify their high-ability middle school girls? c) What resources, structures and supports do schools provide for high-ability girls' academic needs? d) What training in instructional practices and professional development do schools provide to teachers to educate about high-ability girls' academic needs? The semi-structured, in-depth, face-to-face interviews were conducted in the Spring of 2019. The overarching themes that emerged from these interviews are below.

The study consisted of a total of sixteen interviews that were conducted in four different schools. These schools are non-denominational, coed, and NAIS-accredited institutions. Participants in the interviews are teachers at independent schools in New Jersey or New York. Each teacher was asked the same questions, and their responses were audio-recorded with the participant's permission. Following the interviews, each recording was downloaded and transcribed by Rev.com and Temi.com, outside services. Once the coding was completed, similar codes were combined into themes. The themes, which emerged from the experiences of teachers, were explicated from the text of the sixteen

participants in the research study. To ensure anonymity and confidentiality, the schools were coded: A, B, C, and D, and each respondent was assigned a number.

Section 1 identifies the themes that emerged from the research questions. Section 2 links the themes with the specific schools (i.e., it shows which participants from each school mentioned the theme and in which schools there were no participants who mentioned the theme). This section shows the heavier focus on some themes at some schools versus others. Finally, section 3 discusses the association of certain organizational characteristics with the presence or absence of such themes.

Section 1- Themes

Themes from Research Question 1:

a) How do independent school teachers characterize their gifted and talented girls?

Findings

The themes that surfaced from the narratives of the respondents indicate that teachers perceive high-ability girls as far more reserved and quiet compared to their high-ability male counterparts in the classroom setting during discussions or any forum that is more public. Participants stated that the reason for this is a lack of “confidence”. When participants elaborated about this “lack of confidence,” what they expressed is that girls wanted to feel more confident that their answers were correct before sharing them aloud. There was an impression that high-ability girls do not wish to “show off” their talents and abilities unlike high-ability boys- that these high-ability girls are more concerned more

about being right before speaking up. Teachers observed that high-ability girls tend to be more detail-oriented in completing tasks and are also more likely to pursue an area of interest or passion independently than high-ability boys. They indicated that they felt that high-ability girls had more intrinsic motivation, and that when they can delve deeply into something and learn about it, there is a lesser need to have to share it publicly than high-ability boys. It appears that teachers feel that their ability to pay attention to finer details and steps within a process translates to a sentiment that they are, then, more hardworking than their high-ability male classmates. Teachers perceived that high-ability girls are more articulate, both verbally and in writing, compared to their male counterparts.

One participant did emerge as an outlier in describing high-ability girls. This participant's perceptions are described before the "summary" of section 1.

Interview questions (see Appendix A) numbers 1 and 2 were designed to address research question 1 by asking respondents to describe high-ability girls based on their experiences as classroom teachers and how they differ from high-ability boys.

Perceptions of High-Ability Girls

Quiet and Reserved

The first common perception among teachers is that high-ability girls tend to be more quiet and reserved than their high-ability male counterparts. Respondent #3 stated, "...they may have incredible talents, but they don't put it out there in an obvious way, like raising their hand and participating a lot."

Respondent #7 shared:

One subset of them are quiet, do their work, don't ask questions, get their job done, don't want to speak out, and keep themselves on a low profile. And then I'll have some who are more extroverted and want to ask questions and want to push but fewer of those.

High-ability boys were commonly described as loud and highly visible with a tendency to be very vocal about their abilities compared to high-ability girls. Respondent #3 stated, "With high-ability boys, it's the 'me' and the 'I' and it is very like, 'Here I am! This is me! Look at me! See me!'" Respondent #5 shared that perception that boys have a tendency to want to draw attention to themselves. Participant #5 stated, "There are two really strong boys in the eighth grade this year, and both of them are incredibly talented, but they let everybody know that." Respondent #8 stated, "The boys will tend to make themselves known, sort of from day one." Respondent #4 also shared the perception that high-ability boys seek a great deal of attention compared to their high-ability female counterparts:

When I think about my high-ability boys, there is a singularity to them. It's very much like: Me. Me, me, me, me, me. Look at me. Listen to me. Give me more things to do. I want to talk. I don't really care what others are saying, but I want to talk.

Respondent #13 framed this outspokenness as a desire to be seen and for affirmation that what they're doing is, indeed, good work:

[My] high-ability boys...are needy, needy, needy, well, you know, they want to demonstrate 400 times that they are the best at what they do. And they get that some from affirmation from me, some from, you know, just announcing it and just reminding everybody that they are doing well.

Respondent # 7 shared how high-ability boys tend to be more vocal during their thinking process and their findings than high-ability girls and said, "They tend to be louder

and want to question more. Not only ask questions but question what is happening...they'll want to share their knowledge about something." Respondent #14 echoed the sentiment that high-ability boys are more verbally expressive about what they're thinking..."boys are just expected to be like out, out there and kind of loud and you know, they're expected to, to talk out and give their opinions and things like that." Respondent #15 stated, "When I think of high-ability boys, they're more outspoken in class," and this participant went on to say...

I think boys are just expected to be like, out there and kind of loud and you know, they're expected to give their opinions and things like that. So I definitely noticed that my girls will tend to observe what's going on in a room.

Respondent #16 discussed this characteristic and added that high-ability boys are more assertive... "I wonder if there's something to the boy who is going to be more unabashedly assertive, and the girl who is going to do all the work but not necessarily assert themselves." Respondent #7 shared that girls are quiet because they do not want to show that they're intelligent...

One subset [of high-ability girls] is that are quiet, do their work, don't ask questions, get their job done, don't want to speak out, keep themselves on a low profile...they tend to be quiet, and they don't want to rock the boat. They don't want to show that they're smart.

Being "Right"

Some teachers attributed this quietness and reservedness of high-ability girls to a "lack of confidence". In referring to this "confidence," participants primarily referred to high-ability girls not wanting to speak openly about their thoughts and ideas until they were more certain that their responses were correct. Respondent #2 said, "It's confidence,

which in the sciences is unfortunately less present in girls than boys.” Respondent #6 said, “I say to them, ‘You should be confident in what you say, you’re in a safe environment. You can’t go about life doubting yourself.” Respondent #3 said, “Girls pull back in terms of confidence.”

Respondent #1 furthered this sentiment by stating that girls tend to be more quiet because they feel that what they might say has no added value...“A girl is more like, ‘I’m going to make sure that I don’t waste people’s time, in a way, with my answer,” and “They want to make a little more sure that they know what they’re talking about.”

Respondent #9 added that high-ability girls’ quietness can be attributed to fear that what they say will be in contradiction to a peer. This participant said, “They high-ability girls are far less likely to take open academic risks without a safety net. So openly disagreeing is a danger, openly disagreeing with the classmates.” This is in contrast to high-ability boys who have less fear about being wrong. Respondent #6 stated:

High-ability boys are more boisterous, whether they’re right or wrong, they don’t care. They will just jump in, and they will do what they need to do...they don’t think twice before they ask a question.” “...[for high-ability girls there is] the fear of being wrong, fear of being ridiculed...I see girls hesitating to kind of stand up and say, ‘No, I think we should do it this way.’

Neat, Thorough, and therefore, Hardworking

Teachers shared that high-ability girls tend to look at the smaller steps needed to complete a task, and that they do so with more thoroughness than high-ability boys. Because of the ability to pay attention to such details and complete each step carefully, high-ability girls are perceived as more hardworking than the high-ability boys.

Respondent #1 stated:

[High-ability girls] tend to be organized, responsible. Usually pretty neat also. Hardworking. There are many more boys who have extremely messy handwriting or their work isn't as organized. Many more boys than girls. It's very rare...I mean, I have one girl this year who is quite messy and sort of disorganized, but it's much more rare to come across a girl.

Respondent #9 said, "In general, they (high-ability girls) tend to be more concerned about following the rules of academics, the neatness of their work and the care with which it's accomplished."

Respondent #11 reiterated that high-ability girls are more detail-oriented when it comes to completing the steps of a process...

What made high-ability girls stand out is that they also paired natural ability with a sort of executive functioning maturity that some of my, I would say, top boys didn't have. It's more likely for girls to say [in math], 'What is the starting point? What is the ending point? What are all the things in between that I have to make sure I'm ready for.' I see it in English too...the ability to see the smaller steps. Girls literally make lists of the things and boys generally speaking, just don't.

Participant #6 emphasized that high-ability girls work very hard because of a desire to do well and receive good grades.

My experience has shown me that most of these gifted and talented girls work really hard. It's driven from the fact that, 'You know what? I need to do well. I need to study well, I need to get my grades. And because I need to get my grades, I need to work harder.' And in that hard working, they tend to delve into different things.

Independent

Within two schools, high-ability girls are perceived by teachers as being more independent in pursuit of interests and intellectual challenges.

Participant #4 said:

I have strong math girls who are just quietly like, 'I got this, and I'm feeling great about it, and I don't feel the need to talk about it. Do you have another challenge? I'd like to work on it by myself over here and keep going.'

Participant #10 added that this independence is due to an intrinsic desire to do well and seek intellectual challenges. Participant #10 said:

And it seemed like this intrinsic motivation to do well and pursue their passions. In my experience, [high-ability boys] tend to be very motivated by grades and by external factors. They are typically high achieving because they want to reach some sort of goal. Like whether it's winning a competition or some goal.

Participant #12 discussed how this independence manifests itself in how high-ability girls can complete and expand on an assignment entirely on their own. This participant shared:

High-ability girls are able to take an assignment that you give them and elaborate on it. They put their own spin on it in that way. Like they have the thinking to a higher level...They are these thinkers, the ones who can get connections, and they can take an assignment and tweak it. My high ability boys are more like, 'I'm not doing this. I want to do a separate project because this does not speak to my interest...high-ability girls are curious. They have a desire to dig deeper.

Participant #3 shared the same sentiment that girls are more independent in pursuit of knowledge:

Girls appear to be intellectually curious, they seem to have a quest for knowledge, they seek challenge, whether the teacher puts it there or not. They just seem to have that drive. Very self-motivated, enthusiastic, and intellectual risk takers.

Articulate in Writing

Another perception of teachers is that high-ability girls are very articulate, especially in terms of their writing. Participants indicated that in general, writing is a skill that comes easier for girls than for boys. They indicated, though, that high-ability girls'

writing abilities are particularly noticeable compared to their high-ability male counterparts. Participant #1 stated, “Girls can clearly articulate, and you can see their work.” Respondent #4 stated, “I had high-ability girls who were just hitting the ground, sprinting with writing.” Participant #8 shared, “You see it come out a lot in their writing, and in the written work that they do.” Respondent #6 expanded on this by sharing the sentiment that because girls are “good” at writing, they tend to automatically veer to that as a career choice... “Girls come up with the idea, ‘Oh, I’m a much better writer, so I need to go into literature. I need to go into writing.’”

Writing is the way by which teachers are able to see the depth of their high-ability girls’ thoughts, and is a way by which high-ability girls are then identified.

Respondent #5 stated:

High-ability girls are often the ones who are quiet and don’t raise their hands in class, but then you see it in their writing and in any sort of response that they do, especially in English...so it’s always like they start out very quiet, and then you notice that they’re really, really bright, and they don’t really let people see that.

Outliers

One outlier did emerge among participants. Participant #6 stated that high-ability girls’ talents are not inborn or natural unlike high-ability boys. She states, “It’s not very innate. I’ve hardly seen one or two girls who have that love for science and really go deep into science. It’s more driven from the fact that, ‘You know what? I need to do well, I need to get my grades. And because I need to get my grades, I need to work harder. And in that working harder, they tend to delve into different things, and then subconsciously get the information and then become gifted and talented.’” Participant #6 is the only participant

who was born outside of the United States- in India. This participant moved to the United States as an adult after teaching in India.

Summary of Findings

Teachers describe high-ability girls as more quiet and reserved than high-ability boys. They attribute this to the impression that high-ability girls want to be “right” before sharing ideas. Additionally, teachers find that high-ability girls are more likely to break down a task or assignment and complete each portion with more detail and care. Because of this attribute, teachers felt that high-ability girls are more hardworking. Teachers observed that high-ability girls tend to pursue areas of passion or interest more independently. Lastly, high-ability girls tend to be strong writers, able to convey thoughts and ideas on paper articulately.

Themes from Research Question #2:

b) How do independent schools identify their high-ability middle school girls?

Findings

The data gathered from the interviews show some common themes among independent schools. First, there is no concerted, formal focus on the identification of high-ability girls. As mentioned previously, teachers tend to take notice of high-ability girls through their writing, for that is the mode by which their complex thoughts and ideas tend to emerge.

Moreover, participants indicated that there is no comprehensive, formal way to identify high-ability students in general across the board and in various subjects. The exception to this is the use of standardized test scores from ERB and ISEE tests to identify high-ability students in mathematics, as that is the most common subject in which students are assigned to classes that differ by level. In-house assessments are often used to identify students in World Language as well, another academic area in which different levels of classes are frequently formed. Schools tend to use meetings to discuss student needs, and most often, the time is spent on students who are struggling academically or socially and emotionally. Teachers expressed that these meetings are a time for teachers to collectively devise a plan for such struggling students. They indicated that when it comes to a high-ability student who may need more of a challenge, that is dependent upon a teacher's observation and is often communicated individually from one teacher to another.

Interview questions (see Appendix A) 3 and 4 were designed to address research question #2 by asking how independent schools identify high-ability middle school girls in various academic areas and how student needs are shared among faculty.

Informal Identification

When asked what procedures there are, both informally and formally, to identify students with high abilities in various subjects, the initial reaction was that there were no formal procedures. Participant #2 said: "We don't formally identify high-ability students unless a parent has had outside testing, but that's very, very rare. We don't formally screen kids until tenth grade." Participant #3 shared the same sentiments and said it was really on a teacher observation basis, "It's a great question, and I don't think we do formally identify

students with high abilities. I think some of it is just how the kids present and how the teacher who has had those girls will pass us along the information.” Participant #6 “I don’t think we really go about identifying anybody.” Participant #7: “I mean, it’s very informal.”

After the initial reaction, and upon thinking upon it further, teachers did identify that in mathematics and World Language, there is the use of assessments and standardized testing.

Assessment Scores in Math and World Language

Across schools, it is apparent that the ERB and ISEE test scores are often used to place students in various mathematics classes that vary by level. In-house assessments are also used to place students in a World Language class. Participant #3 said, “We use test scores a bit...I think where it becomes more overt is math, because of the conceptual math classes.” Respondent #9: “In our math groups, we take the previous year’s ISEE scores, which we administer the spring before in addition to teacher recommendations.”

Participant #1 made mention of both math tracking and the use of standardized test scores:

I mean, in math we do track the math. So our criteria for tracking, we look at ERB scores, we look at test average, and bonus problems. So those are more difficult problems that require maybe multiple steps of working through a problem or just a stretch, like not something specific that was learned but applying a concept. [For ERBS,] it’s rare for a six to be in a high-level class.

Participant #7 shared similar thoughts, but in their school, they use school-created placement tests rather than standardized tests:

Informally, we do a placement test so the only gifted and talented thing we have is for mathematics and foreign language. We do a placement test at the onset of the

year where students are put into a class according to ability. Other than that, there is nothing else.

Respondent #10 stated:

Okay, well, here at this school kids are tracked in math and foreign language. So there's different levels of math and different levels of Spanish. So you know, the stronger students in math and Spanish can be placed in the advanced classes. What grade that does start tracking for math is fifth grade.

Meetings

A frequent means by which faculty discuss students occurs through meetings in which teachers who teach a particular grade level come together. At these meetings, faculty and staff may touch upon high-ability students, but a majority of time is spent on children who are not meeting expectations. Participant #7 stated that meetings are used to discuss every child but the focus ends up being on children who are struggling. Participant #16 said, "Our meetings are focused on, like, students of concern." Participant #2 said, "At the start of the year, there will be a meeting about particular students who might need more support that would be considered, might need additional something." When asked about the focus of meetings about students, Participant #5 shared:

I think it definitely comes up that they're doing well, but we definitely spend more time trying to help kids who are at the bottom, kind of bringing them back up to where everybody else is. And I think the ones at the top kind of go a little bit more under the radar because they're doing so well, it's easy to just let them continue doing what they're doing...As a team, we all have one period where we're all free together. So if something comes up and it's urgent, we use that time to review what we need to do.

Participant #10 said that meetings tend to veer toward children who are struggling because of a lack of an agenda:

[At meetings] we tend to as teachers focus on the kids who are struggling more....in our sixth grade team meeting, it's just the advisors and sometimes the division head who come in and the agenda is made up on the spot. You know, who do you want to talk about this week? What do you want to talk about? And it inevitably always turns to the kids who are struggling or a behavior problem going on and it becomes storytelling.

When it comes to not meeting expectations, some teachers referred specifically to children who are struggling not academically, but rather behaviorally, socially, and/or emotionally. Respondent #15 shared, "We have meetings every week and we just talk about kids. But I'll say most of the time, unfortunately, it becomes about behavioral things." Participant #1 said, "When we talk about it at all, it's the students who are struggling. We really don't [talk about high-ability students] unless something comes up, whether it's they are overly stressed." Respondent #14 shared that the guidance counselor is present at these meetings about children because they usually touch upon issues related to their social well-being..."The needs of those students who are struggling, that would be conveyed in guidance meetings. Whole group, whole team meetings. It's like call in all the folks, and how are you going to put supports in place for this child?"

Participant #3 mentioned the use of meetings to touch upon all students, not just those who are experiencing challenges... "We have these meetings early in the school year to discuss each house and they'll say, 'This child is really strong in X,Y, Z, and we made these arrangements.'" Respondent # 8 stated, "We meet as a grade about once a week. At the beginning of the year, we go through the roster. And then, as the year progresses, we tend to talk about low-end kids and high-end kids. And then casually hitting on the kids that fall in the middle."

Individual Observations and Conversations

Teachers shared that high-ability students are discussed more on an individual basis rather than a whole-group discussion. Participant #4 shared:

The needs of students who are struggling are shared in guidance meetings, that they are whole group, whole team, and that the inverse of that for somebody who is gifted and talented is one-on-one. We might need to put some more things in place for this child because she needs to be supported with enrichment. But is often a one-on-one conversation. That's what I mean by informal one-on-one...sometimes a house advisor will convey that to a specialist teacher- like so and so is really chomping at the bits for this. I'm encouraging her to meet with you for a lab.

Participant #6 shared that frequent individual conversations and interactions is how high-ability girls tend to be recognized:

Each one of us has a different method of figuring out how well the child is doing...so we are always in touch with each other, we're always talking to each other, so if I have a child who really needs more, I'll speak to so and so, and you know, we have a conversation, and I'll say, 'This child is really wanting to do extra stuff.'

Participant #8 echoed the informality of identification processes of high-ability girls:

So most of it is based as conversational, teachers confirming they want to discuss students. And it's totally just.... 'This kid does really well in my class. Does he do really well in your class? Yes he does. Or she doesn't. So where are her strengths?

Participant #2 furthered the idea that 1:1 discussions happen frequently and that it is the teachers who push the child to seek opportunities for enrichment... "House advisors will often reach out to particular teachers, and we encourage students especially as they go through school, to kind of self-advocate and to make labs."

Summary of Findings

These independent schools do not have formal processes by which they identify high-ability girls, nor high-ability students at large. It is common among these independent

schools to use ERB and ISEE scores to identify students they consider to be highly able in the areas of mathematics and world language. Other than those two subject areas, there are no formal, systematic ways to identify high-ability students. It is common among these schools to have regularly scheduled meetings among grade-level teachers to discuss students. A majority of the time during these meetings, teachers discuss students who are struggling either academically, behaviorally, socially and/or emotionally. Teachers indicated that these meeting times are not commonly used to devise systematic plans for high-ability students. When high-ability students' needs are discussed, it most often happens on an individual basis. It is common for a teacher to notice a high-ability child in a class and discuss the student with another academic or homeroom teacher about how to best meet his/her needs.

Themes from Research Question #3:

c)What resources, structures and supports do schools provide for high-ability girls' academic needs?

Findings

The findings indicate that these independent schools do not offer specific courses that cater to high-ability girls, but there are some that are for girls in general. These independent schools offer a variety of after-school clubs and electives that are provided during the school day. Teachers indicated that this is a primary way by which they meet the needs of high-ability students in general- both boys and girls- because it provides choice to pursue areas of interest. Some of those courses include: art, dance, science electives, and

maker spaces. Some participants discussed how some offerings are for girls only, but not specifically for high-ability girls. Some of those offerings include coding or girls' leadership. Another common way that these schools meet the needs of high-ability learners is through independent projects in which students can delve deeper into concepts or topics of choice. These projects may be related to curriculum content but can also be a concept unrelated to what a child is learning in school.

Much of the intentional programming is geared toward areas in STEM.

When designing curriculum, teachers intentionally incorporate choice as another way of challenging high-ability learners. Schools will also often recommend programming offered by outside organizations that might appeal to high-ability learners or when parents seek enrichment for their child. Schools participate in competitions like Math Olympiad as a way to engage high-ability students- both boys and girls. If a child demonstrates mastery in a particular subject, the school may accelerate the child into a class one year above grade level or have the child skip a grade altogether. Teachers mentioned the use of online materials to offer additional challenge to high-ability students at large, not ones that specifically cater to high-ability girls. They also made mention of the use of effective questioning to push a student to think more critically.

Interview questions (see Appendix A) 5, 6, and 7 were designed to address research question #3 by asking what resources, structures and supports schools provide for high-ability girls' academic needs.

After-School Clubs and Electives

A number of these independent schools offer a variety of electives during the school day and after-school clubs. Participant #1 said, “There’s a lot of after-school programming that parents can choose from.” Participant #6 focused on electives related to STEM: “We have computer science, biology, anatomy, forensics...” Participant #10 focused on electives centered around the arts: “One very cool thing is that we have the art elective program. There’s just such a broad array from Creative Writing to Technology to Ceramics.” Participant #5 shared electives that fall under both categories: “They have different sorts of electives that they can take. We have a pretty popular dance program...so they have dance, photography, digital drawing, music. We’ve had robotics, we’ve had computer programming, and I do a yoga club.”

Participants #13 and #15 talked about electives offered in the area of innovation. Participant #13 said, “They have electives they can choose. They take innovation which has like saws and lasers...there was a Forensics one.” Participant #15 said, “There’s guitar, innovation, 3-D art.” Participant #5 shared: “They have different sorts of electives that they can take. We have a pretty popular dance program...so they have dance, photography, digital drawing, music. We’ve had robotics, we’ve had computer programming, and I do a yoga club.”

Girl-Specific Clubs

Some of these clubs are exclusive to girls. Participant #3 talked about academic clubs, “There are some specific to girls, like a debate club and a Model UN.” Participant #4 shared, “We have clubs that are more academic-based than others. We have robotics club, rock band club...Bit by Bit, a coding thing for girls.”

Participant #8 highlighted clubs specific to a girls' social/emotional development...“We do have a Girls Leadership Club, it's more about reinforcing self-esteem, and understanding the societal pressures on girls. It's not so much about assuming leadership.” Participant #7 said, “We do have a clubs program. So we have Newscast, we have girls who take on the anchor role and they can do a video production and all of that. We did a mini robotics club. We have a Girls Leadership Club. I have a young woman who wanted to start an allergy awareness club.”

Competitions

Several schools commented on competitions as a way to challenge high-ability students. These competitions mentioned were all based in the area of STEM. Participant #3 said, “Like I think our chess team is co-ed, but there's this subgroup of girls only who compete...there's Math Olympiad. There are scholastic competitions for writing.” Participant #6 shared, “Two years back we had a girl who basically was able to win a prize through the Jet Propulsion Lab in NASA.” Participant #11 stated, “We do have various contests. Like there's the AAMC contest which is a national contest where they take the test and the highest achievers can sort of get awarded for performing that way.”

Independent Projects

Another way these schools meet the needs of their high-ability learners is through independent projects, where students can choose an area of interest and pursue that area in more depth. Participant #1 said, “We have lab four out of five days a week, and it is a chance for kids to meet individually with teachers and go into depth on something they're

interested in.” Participant #16 stated, “I remember we sat down and like the student and I worked out, and I just gave supplementary material, and the projects that students did, I sort of raised the expectations for what it was really for.” Participant #5 stated, “We have some pretty interesting independent studies where if the kid’s interested in whatever topic, they can approach a teacher who they think would be a good person to help them study that topic, and then craft their own independent research and project.”

Two respondents discussed independent projects specifically in the area of STEAM.

Respondent #2 talked about a science program:

We have a research program, the Dawson Science Research Program, where students meet once a week, and they learn to read scientific papers. They delve into different science topics basically...I am hiring someone who will just be here to help and work with kids and just be available to any student who wants to do extra science experiments.

Participant #6 mentioned a project related to oceanography.

The other thing that is really, really key to our program is we have the independent study program...So last year we had a student who wanted to study the coral reefs. So the school literally invested in one of the biggest aquariums, got all the coral reefs, got all the fish that were needed in it. She talked about the coral bleaching...The other thing we have are autonomous advanced seminars. So teachers provide advanced seminars on these niche topics, and students can do a three or six month course, and students can choose to go into niche topics.

Outside Programming

Four teachers mentioned the use of outside programming to meet the needs of some of their high-ability students. Participant #14 shared, “If you happen to have a student who you see has demonstrated an interest or proficiency in writing, and you happen to know

about an outside program. When I was in the city, we did a lot of programs with like, John Hopkins Center for Talented Youth.”

Participant #1 stated:

A lot of times it’s because the parents have put the child in an outside program that teaches the material,” and, “If a parent feels like a program isn’t challenging enough and their kid isn’t excited about, let’s say, math anymore in school, then they say to themselves, ‘Well, I want my kid to love math still, so I’m going to look for something for my child to do outside of school.’

Two participants mentioned programs offered in the summer months. Participant #6 said, “So maybe we will recommend them a summer program...” Participant #13 shared, “I know there’s lots of programs that the school is associated with...directed like to also external camps or things.”

Project Choice within Established Curriculum

Teachers discussed how they were intentional about offering choice within the curriculum of their academic discipline. Respondent #10 shared, “There’s a push to strengthen our independent reading program...have been talking about book clubs in which, there might be, we’ll have two options during the unit.” Participant #5 shared, “There’s a science project called *Change the World Project*, and they can literally pick anything that interests them that could be a way to change the world. That’s what I’ve been doing- the focus of a workshop-style that is a lot more choice-based and independent.”

Some participants talked about choice in terms of how students can demonstrate understanding of a topic. Participant #13 said, “We wrote a story about food traveling through the digestive system. You can make a video, you can make a book...and they could

pick and pick your way you want to express it.” Participant #7 said, “On extended thinking tasks or projects, they have a lot of choice.” Some respondents discussed choice in terms of content that can be covered or learned.

Online

Several teachers commented on the use of online resources as a way to meet the needs of high-ability learners. Participant #6 said, “It’s way more hands-on, and they’re doing a lot of experiments, but they’re doing a lot of online self-activities...like reading an article in National Geographic, and writing a dialogue.” Respondent #11 said, “We use IXL.com for working on skills stuff.” Respondent #15 said, “There’s some computer-based stuff as well...There’s Coding. I use ACS logo.” All these resources were related to areas in STEM.

Acceleration

Several teachers also commented on the use of acceleration- moving a student a grade ahead- as a way to meet the needs of high-ability students. Participant #1 said, “For example, we have kid in seventh grade who the teacher identified as being very strong and we gave her the opportunity to accelerate, just skip eighth grade math.” Participant #11 “If there’s a student who is truly gifted and deserves to be at least a level advanced from that, then we explore giving them an individual class that’s even say above eighth grade.” Participant #7 said, “I remember, once, a few years ago, I had a student who felt that way and was truly gifted, and we really didn’t have something we could do, aside from moving her because we’re small, into another grade level of course.”

Questioning

Two participants briefly touched upon the theme of effective questioning techniques. Participant #1 said, “I think the questions you design should ultimately have multiple approaches to them.”

Participant #4 stated:

I think some things that are hard and that I would like to see questioned are questions. I'd like it for all students to have the tables turned on them and say, 'What questions do you have? What are you thinking about? Are you just going to take what I say as truth?' so like, to understand how to craft questions that will get you further into that inquiry.

Summary of Findings

The most commonly-mentioned way by teachers in how their schools cater to the needs of their high-ability girls (and high-ability students at large) is through a variety of electives within the school day as well as after-school programs. They indicated that in forming these electives and courses, there is not any particular attention given to high-ability girls. Many of the electives, programs, and online offerings are geared toward areas in STEM.

Teachers discussed competitions as a way to engage high-ability students in general. Schools provide resources so that students can pursue projects independent of the designed curriculum. These projects can be related to something a child is studying at school or something entirely unrelated to the curriculum. Some schools will convey knowledge of a particular outside program to parents that may be of interest to their high-ability children. When designing curriculum, teachers intentionally incorporate choice- of

process, method of receiving information, or demonstrating understanding of the content. Teachers use online resources as a way to supplement the already-existing curriculum. Some schools use acceleration- moving up a student a grade level- when a student demonstrates that he/she has already mastered the grade-level content. Lastly, two participants discussed how to question effectively in class to foster higher-level thinking.

Themes from Research Question #4:

4) What training in instructional practices and professional development do schools provide to teachers to educate about high-ability girls' academic needs?

Findings

The collective responses from respondents indicate that there is little professional development that schools provide specifically related to meeting the needs of high-ability girls. The main focus among these schools is diversity, equity, and inclusion as it relates to race and gender. A few participants mentioned Design Thinking. Two participants discussed professional development specifically related to girls which are applicable, specifically, to high-ability girls.

Interview questions (see Appendix A) 8, 9, and 10 were designed to address research question #4 by asking what training in instructional practices and professional development schools provide to teachers to educate about high-ability girls' academic needs.

Diversity, Inclusion, and Equity

Issues surrounding diversity, inclusion, and equity are at the fore for most of these independent schools. They focus especially on race and gender. Participant #13 said, “The professional development focus has been diversity, equity, and inclusion.” Participant #1 shared, “Issues around equity in general have been a focus for the school.” Respondent #2 stated more specifically, “So we have equity work...gender is a huge issue.”

Gender

The first major theme that emerged in relation to diversity, equity and inclusion was gender. Participant #13 said, “There is one related to sexuality and gender...and we’ve had some optional meetings you can do. The most recent was about a transgender boy. I don’t know if you’ve read that book, *George*.” Participant #16 said, “I can think of the Jennifer Bryan one.” (Jennifer Bryan does work specifically related to gender and sexuality.) Participant #3 said, “Diversity and Inclusion work. That’s where they put a lot up there. We’ve done some work with gender. We have have just one person come in, just talking about, for students who are transgender...and you know, gender and everything on a spectrum. LGBT work.” Participant #15 said, “We’re doing a lot with LGBTQ things right now. We have a transgender student who is coming up next year. So we’ve been trying, we have gender, not gender specific bathrooms and things like that.”

Race

The other theme that emerged as it relates to diversity, equity and inclusion was race, and, even more specifically, the ideas surrounding whiteness and white privilege.

Participant #10 said, “We’ve had diversity meetings. There is an equity and inclusion committee here that does a lot of great work. I went to the Diversity Conference and focused on white, being white, and you know, what white means.” Participant #12 stated, “I think there has been continuing efforts to fund diversity and inclusion, whether it’s local workshops, or like, I went to the White Privilege Conference a couple of years ago.” Participant #13 said, “So the last one was about a girl, and she was biracial and finding her way in college.

Design Thinking

Two participants mentioned Design Thinking, a methodology with specific steps to addressing a problem with creative solutions. Participant #4 said, “Last year, I focused on design thinking and extrapolation.” Participant #6 stated, “We’ve had quite a bit of training on that, so we’ve had experts come in, talk about the center of innovation and design, what is design thinking.”

Girl-Specific

There were two participants who mentioned professional development that was specific to girls.

Participant #8 said:

I’ve done a lot of professional development on girls, specifically. I took a couple of teachers to the National Coalition of Girls Schools symposium. I went to the global symposium in D.C. in June of last year. It is about how to best educate girls with all the challenges that they face in this day and age. So it’s a lot of taking that and saying, ‘Well, okay, how does this work in a co-ed environment?’ It was about collaborative rubrics, and reflective assessments really help girls not to focus so

much on achieving 100%, but pushing themselves from wherever they are to the next point. And using that as a metric for grading them, which takes a lot of the pressure off of the high-achieving girls. But it was interesting in the way that that helps girls, and then in math and science how teaching girls is about...there's not one answer...the thought process is what's more important. And a lot of teachers at all-girls schools are trying to say, 'All right, show me the 10 ways that you failed in order to figure out this problem. And I'm grading you on all the different ways that you tried to get an answer. Not on your answer.' And how that helps shift these super intense, high-achieving girls into a mindset of like, 'Okay, I just have to manage that discipline.'

Participant #13 said, "I will say that we did have a person come and talk to the kids, the teachers, the parents. And it was all about, it was very interesting, but it was about how kind of perfectionism has pushed for girls versus boys and the differences there. And I know she spoke with the girls and the boys separately.

Summary of Findings

The respondents indicated that the most commonly provided professional development is related to diversity, equity and inclusion; specifically, issues of race and gender. This did not include the differences in how boys and girls learn but rather gender inclusivity. Two respondents mentioned Design Thinking, and two respondents discussed professional development specifically related to girls.

Themes from Research Question #5:

5) What are the barriers to catering to highly able female learners?

Findings

Several themes emerged from the responses of the participants. The one most frequently touched upon was girls' lack of self-efficacy- the belief in oneself to execute a

task or to produce particular outcomes. Respondents also indicated that our culture is male-dominated in so many ways and this is finely interwoven into the fabric of society. One specific aspect of this is the idea that, for a girl, being smart isn't considered "cool." Other respondents discussed the lack of time within the school structure to spend with high-achieving students.

Interview question (see Appendix A) 11 was designed to address research question #5 by asking what barriers there are to catering to highly able female learners.

Lack of Self-Efficacy

Participants expressed that one of the biggest challenges to meeting high-ability girls' needs is their lack of self-efficacy. Participant #8 shared this lack of self-efficacy to the "Imposter Syndrome"... "You see a lot of perfectionist behavior, and stress and anxiety...and the Imposter Syndrome happening with our highest girls. ...boys are like, 'Okay, I've got a C. I can keep going.' And all the girls are like, 'I got a C. I am a failure, and I can't do this anymore!'" Participant #3 said, "They don't ever feel like they know enough, that they understand enough. I do think that females in male-dominated fields have to prove themselves. They have to have a tough skin."

Participant #1 shared this perception about her high-ability girls and about her own self:

I think it's like, believing in themselves, getting them to see that they are doing...I do think they, deep down, know that they're doing well...And for me, I would not put myself in a position where there was a good chance I would not do a good job at something. But I think there are lots of boys that don't mind.

Participant #2 stated, "I think it's in the water. It's just so pervasive..so systemic. So the greatest challenge is their own self-perception." Participant #14 said, "I think developing that assurance...like, 'Go forth you're ready.'" Participant #15 stated, "Definitely believing in themselves."

Male-Dominated Culture

Participants shared that our society is one in which males are more visible, given more due credence, and more discussed. Participant #4 said, "Sometimes our calibration is skewed to boys." Participant #13 stated, "There's a male dominated vibe here...there's a lot more girl students, but it just seems like the conversation and sort of the way things go, what sort of is allowed to fly for boys versus girls is different."

Participant #5 talked about the boys in highly-visible roles:

It's challenging because of the culture.....so the middle school and upper school gathers together, and usually there's a student emceeing the meeting...they run it like it's a show, and not like it's an important meeting for the day to bring our community together. And it's just kind of you get these goofballs up there...you get a lot of boys running the show.

Participant #11 touched upon this notion that society has an abundance of males in highly-visible roles.. "In our culture,the easiest role models out there tend to be men. And I think that's a problem. I have not had the luxury of time to take out of the regular curriculum to do any sort of research stuff."

What's "Cool"

Also embedded in society is the notion that girls don't wish to be characterized as "smart" because it's not "cool." Participant #4 said, "I think at this school, it's not cool [for girls to be smart] per se. Participant #7 shared, "I don't think it's cool anywhere in the United States for girls to be smart. I don't think it's something they see as cool."

Time

Respondents mentioned the lack of time during the structured school day to spend with high-ability students. Participant #16 said, "We have a schedule that is rigid, and one of the things that makes classrooms more conducive to learning is a schedule that is more flexible."

Participant #10 discussed the amount of time spent with students who are struggling:

I'd say it's time. It's the limited time and knowing that in a class period, if I have to meet with 17 kids about their writing, I'm going to spend one or two minutes with the high achievers, so that I can have five or six minutes with the kids who are struggling. And what I should be doing is spending an equal amount of time with everyone because those high achievers need this.

Participant #12 touched up the same theme as it relates to children who require more attention to manage behaviors... "I've had classes where the management of like special needs is really time consuming, and that leaves me with no time to have a conversation with a high-achieving kid."

Summary of Findings

Participants find that girls, specifically high-ability girls, lack self-efficacy. They want to make sure that they are "right" for fear of making a mistake. Therefore, they tend to give

up easily at the first sign that they may fail at an endeavor. This may be linked to the fact that respondents indicated that our culture is male dominated. That is, men are more celebrated in various fields, and are more visibly seen and acknowledged. Another aspect of our male-dominated culture is that “being smart” is “cool” for a boy but not for a girl. Other few respondents discussed the lack of time within the school day to spend with high-achieving girls to foster their skills and develop their interests.

Section 2- Themes that Emerged from Each School

This section gives a breakdown of the themes that emerged from the participants in each school. Column 1 states the theme. Column 2 shows the school in which the theme emerged and how many participants from each school mentioned the theme.

Themes from Research Question #1- Perceptions of High Ability Girls

Theme	School in which theme emerged. (<i>Each check represents a participant from the school who mentioned the theme.</i>)			
Quiet and reserved				
	A	B	C	D
	✓✓	✓✓✓	none	✓✓✓✓
Being “right”				
	A	B	C	D

	✓✓✓	✓✓	✓	none
Neat, thorough, hardworking				
	A	B	C	D
	✓	✓	✓✓	none
Independent				
	A	B	C	D
	✓✓	none	✓✓	none
Articulate in Writing				
	A	B	C	D
	✓✓	✓✓✓	none	none

Themes from Research Question #2- How Independent Schools Identify their High-Ability Middle School Girls

Theme	School in which theme emerged. (Each check represents a participant from the school who mentioned the theme.)
Informal identification	

	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓</td><td>✓✓</td><td>none</td><td>none</td></tr></table>	A	B	C	D	✓✓	✓✓	none	none
A	B	C	D						
✓✓	✓✓	none	none						
Assessment scores in math and world language	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓</td><td>✓</td><td>✓✓</td><td>none</td></tr></table>	A	B	C	D	✓✓	✓	✓✓	none
A	B	C	D						
✓✓	✓	✓✓	none						
Meetings	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓✓</td><td>✓✓✓</td><td>✓</td><td>✓✓✓</td></tr></table>	A	B	C	D	✓✓✓	✓✓✓	✓	✓✓✓
A	B	C	D						
✓✓✓	✓✓✓	✓	✓✓✓						
Informal observations and conversations	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓</td><td>✓✓</td><td>none</td><td>none</td></tr></table>	A	B	C	D	✓✓	✓✓	none	none
A	B	C	D						
✓✓	✓✓	none	none						

Themes from Research Question #3-Resources, Structures and Supports for High-Ability Girls

Theme	School in which theme emerged. <i>Each check represents a participant from the school who mentioned the theme.</i>
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After-school clubs and electives				
	A	B	C	D
	✓	✓✓	✓	✓✓✓
Girl-specific clubs				
	A	B	C	D
	✓✓	✓✓	none	none
Competitions				
	A	B	C	D
	✓	✓	✓	none
Independent projects				
	A	B	C	D
	✓✓	✓✓	none	✓
Outside programs				
	A	B	C	D
	✓	✓	none	✓✓
Project choice within established curriculum				

	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>none</td><td>✓✓</td><td>✓</td><td>✓</td></tr></table>	A	B	C	D	none	✓✓	✓	✓
A	B	C	D						
none	✓✓	✓	✓						
Online programs	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>none</td><td>✓</td><td>✓</td><td>✓</td></tr></table>	A	B	C	D	none	✓	✓	✓
A	B	C	D						
none	✓	✓	✓						
Acceleration	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓</td><td>✓</td><td>✓</td><td>none</td></tr></table>	A	B	C	D	✓	✓	✓	none
A	B	C	D						
✓	✓	✓	none						
Questioning techniques	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>none</td><td>none</td><td>none</td><td>✓✓</td></tr></table>	A	B	C	D	none	none	none	✓✓
A	B	C	D						
none	none	none	✓✓						

Themes from Research Question #4- Training in Instructional Practices and Professional Development for Teachers About High-Ability Girls

Theme	School in which theme emerged. (<i>Each check represents a participant from the school who mentioned the theme.</i>)
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Diversity, inclusion and equity				
	A	B	C	D
	✓✓	none	none	✓
Gender				
	A	B	C	D
	none	none	none	✓
Race				
	A	B	C	D
	none	none	✓	✓
Design thinking				
	A	B	C	D
	✓	✓	none	none
Girl-specific				
	A	B	C	D
	none	✓	none	✓

Themes from Research Question #5- Barriers to Educating High-Ability Girls

Theme	School in which theme emerged. (<i>Each check represents a participant from the school who mentioned the theme.</i>)											
Lack of self-efficacy	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓✓</td><td>✓</td><td>none</td><td>✓✓</td></tr></table>				A	B	C	D	✓✓✓	✓	none	✓✓
A	B	C	D									
✓✓✓	✓	none	✓✓									
Male-dominated culture	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓✓</td><td>none</td><td>✓</td><td>✓</td></tr></table>				A	B	C	D	✓✓	none	✓	✓
A	B	C	D									
✓✓	none	✓	✓									
What’s “Cool”	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>✓</td><td>✓</td><td>none</td><td>none</td></tr></table>				A	B	C	D	✓	✓	none	none
A	B	C	D									
✓	✓	none	none									
Time	<table><tr><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>none</td><td>none</td><td>✓✓</td><td>✓</td></tr></table>				A	B	C	D	none	none	✓✓	✓
A	B	C	D									
none	none	✓✓	✓									

Section 3- Connections Among Themes and School Characteristics

Connections in Research Question #1

For research question one, the theme of high-ability girls' desire to "be right" and that they are perceived as "neat, thorough, and hardworking" emerged in schools A, B, and C, but not D. School D is the only school in which both the Head of School and Head of Middle School are both male. The other schools have at least one female as the Head of School or Middle School Division Head.

Connections in Research Question #2

For research question two, the theme of "informal identification" and "informal observations/conversations" as a means to identify high-ability girls were present in both schools A and B. Schools A and B both end in grade 12, whereas the other two schools end in grades 8 and 9.

Connections in Research Question #3

For research question three, the theme of "independent projects" and "outside programs" were present in schools A, B, and D. In all three schools, the Chairman of the Board and the Head of School are both males.

Connections in Looking at Themes as a Whole

In terms of looking at themes as a whole, there were a number of themes that emerged in schools A, B, and D (i.e., "quiet and reserved," "outside programming," "perfectionist behavior," "male-dominated culture"). A few characteristics common to

schools A, B, and D is that in all three schools, the Chairman of the Board is male, and the Head of School is male.

There were a number of themes that were present in schools A and B but not in schools C and D. This includes: “articulate in writing,” “informal identification,” “informal observations,” “girl-specific clubs,” “DesignThinking,” and “what’s ‘cool.’” A characteristic common to A and B is that they are both K-12 schools, whereas schools C and D are not (i.e., they end in grades 8 and 9, respectively).

There were also a few themes that were present in schools C and D (i.e., “project choice,” “race” as focus for diversity work, and “time” as a barrier). The reverse is also apparent. There were a few themes that were not present in both schools C and D, but present in schools A and B. Both schools C and D are the only two schools in which the Head of School and Head of Middle School are male.

The subsequent Chapter 5 provides a summary of the findings in relation to the research questions and to previous research studies. The chapter ends with conclusions and implications for future research.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND SUMMARY

Introduction

This final chapter summarizes the findings of this study, relates the findings to the literature reviewed, and offers suggestions for practice, policy and future research. The purpose of this study was to explore how coeducational independent middle schools are meeting the academic needs of their most highly able girls. This study addressed the following research questions:

- a) How do independent school teachers characterize their gifted and talented girls?
- b) How do independent schools identify their high-ability middle school girls?
- c) What resources, structures, and support systems do schools provide for high-ability girls' academic needs?
- d) What training in instructional practices and professional development do schools provide to teachers to educate about high-ability girls' academic needs?
- e) What are the barriers to catering to highly able female learners?

As indicated in the methodology chapter of this dissertation, the study consisted of a total of sixteen interviews that were conducted in four different schools. These schools are non-denominational, coed, and NAIS-accredited institutions. Participants in the interviews

were teachers at independent schools in New Jersey or New York. Each teacher was asked the same questions, and their responses were audio-recorded with the participant's permission. Once coding was complete, similar codes were combined into themes. The themes, which emerged from the experiences of teachers, were explicated from the text.

Discussion of Findings

Research Question #1- Perceptions of High-Ability Girls

The perception of participants that high-ability girls tend to be articulate in writing is in line with research that finds that high-ability girls are frequently voracious readers who are highly verbal and have advanced vocabulary compared to males (Kerr, Vuyk & Rea, 2012). They are, therefore, able to communicate clearly both verbally and in writing (Davidson Institute, 2018). Also in line with research is the perception of participants that high-ability girls are concerned with being "right" and therefore, they are more likely than boys to withhold sharing their ideas or findings on subjects only until they are certain that their answers are correct. Researchers state that because of more pressure to appear "perfect," high-ability girls may be less likely than boys to take risks for fear of failure or seem apathetic about their own talents (Davidson Institute, 2018). They may also fear that they will no longer be perceived "smart" or "intelligent" if proven wrong (Fogarty, 2017).

The perceptions from participants that high-ability girls tend to be thorough and hardworking as well as independent is in line with what research finds about both high-ability boys and girls. Research shows that a common characteristic of high ability children

at large is that they tend to hold high expectations of themselves. They can also intensely pursue topics of interest on their own and have a high desire to learn (Clark, 2002).

Research Question #2- Identification of High-Ability Girls

Participants across these independent schools shared that identification procedures are, by and large, informal and occur through meetings as well as individual observations and conversations. Callahan and Herterg state that such methods ought to be a part of the identification procedures (2013). A key component to successful programming is the need for a common understanding of what giftedness means among its community members. Then, the development of thorough and comprehensive identification procedures used to assess giftedness are necessary. These components should directly guide programming and curriculum (Callahan, Renzulli, et al., 2013). These two pieces- a common definition and thorough/comprehensive procedures do not exist in these independent schools.

Research Question #3- Resources, Structures and Supports for High-Ability girls' Academic Needs

Although the participants indicated that their identification procedures for high-ability girls are not aligned with best practices informed by research, participants shared that their schools do provide structures and resources for such students, many of which are aligned with best practices indicated via research. Participants indicated that their schools offer a variety of after-school clubs and electives, including in the arts. Quality fine and performing arts programs consistently correlate with positive outcomes in a number of ways for students (Duma & Silverstein, 2014). Participants from several schools mentioned

involvement in competitions; the chance to compete is a valid and engaging way to enrich content (MacFarlane, 2018). The use of technology is another way schools cater to high ability girls, according to participants. MacFarlane states that technology permits students access to various programs that they may not otherwise have for many reasons, such as school option limitations (MacFarlane, 2018). Participants also mentioned acceleration as a way to meet the needs of high-ability girls, and such a tactic has been widely proven to be cost-effective and highly beneficial for such students (Colangelo, Assouline, Gross, 2004).

Participants from these schools did not mention some of the widely-used structures and models created and frequently mentioned in gifted and talented research. Renzulli's Multiple Menu Model, Tomlinson's Parallel Curriculum Model, Betts' Autonomous Learner Model, and Kaplan's Depth and Complexity Model were not mentioned by participants.

Research Question #4- Training and Professional Development for Teachers To Meet High-Ability Girls' Needs

The respondents indicated that there is little to no professional development that these independent schools provide related to the meeting of highly able girls' needs. Some areas of focus for these schools include issues related to diversity and equity (specifically as it pertains to race and gender inclusivity).

Research Question #5- Barriers to Meeting High-Ability Girls' Needs

Participants from three schools identified perfectionist behavior as one of the greatest barriers for high-ability girls, which is in line with what research has found. For many of these learners, learning can come easily. The praise that accompanies this from

adults may be how they define themselves. Therefore, they may become unwilling to try challenges for fear of failure (Fogarty, 2017). Girls also tend to have lower self-esteem than boys during their schooling years, and have a desire to appear “perfect.” They may, then, be less likely to take risks so as not to jeopardize that appearance (Davidson Institute, 2018). Another theme that emerged from participants that coincides with research is that girls are bombarded with media messages that tell them that being smart isn’t “cool” and so may feel compelled to hide or downplay their intelligence (Smith et al., 2009). Participants also discussed a male-dominated culture; the pressure to be pretty and popular can lead high-ability girls to surrender to such stereotypes and stop participating in activities they once enjoyed (Kerr, Vuyk & Rea, 2012).

Recommendations for Practice

The study has yielded some recommendations for practice in order for independent schools to meet the needs of its high-ability girls. First, educators should understand some of the common characteristics of high-ability students in general, and then how high-ability girls tend to differ from their male counterparts. When identifying highly-able girls, educators should bear in mind the range of behaviors often exhibited by them. Educators should look for discrepancies between things such as: self-concept and performance; average or low test scores and exceptional originality, a tendency to avoid participation despite signs of strong ability, or stark contrast between school performance and abilities reported by adults (Davidson Institute, 2018). Teachers should keep in mind that gifted girls may push back on requests to stay on-task, they may be improperly or prematurely diagnosed with ADHD (Webb et al., 2005).

In terms of programming, studies show that a continuum of services is best in meeting the needs of high-ability students, not just the frequent use of a single model. Therefore, schools should adopt researched-based models as well as offer a variety of clubs/electives, including some that are offered specifically to girls. By middle childhood, highly able girls' self-esteem is high- and they tend to work hard on projects that interest them. They tend to more enthusiastically pursue an endeavor when not tasked with having to share their findings or observations compared to their male classmates. This is because their motivations are often more intrinsic than high-ability boys. It is important, then, for schools to discover what sorts of projects stimulate the high-ability girls and provide ample opportunities for them to pursue these interests without having to publicly present their findings.

Girls are more susceptible to the bombardment of negative media messages about what it means to be a girl, and so schools can actively combat such stereotypes through ways like media literacy classes. Actively working against these stereotypes are important because girls may surrender to the stereotypes and stop participating in activities they once enjoyed (Kerr, Vuyk & Rea, 2012).

Recommendations for Policy

Schools should make sure that they have a clear definition of giftedness. This definition should be revisited and revised regularly according to the latest research. In addition, schools should come up with a comprehensive identification procedure to identify high-ability students; it ought to include multiple and specific means by which students can be considered at different points in their educational career (Davidson Institute, 2018).

This study demonstrated that these independent schools tended to use ERB scores to identify high-ability girls in mathematics. Given that girls can underperform due to a variety of factors related to things such as stereotype threat, it is critical that a school uses other methods such as checklists, observations, etc. A well-devised procedure will ensure that there is not underrepresentation of girls. In the development of the identification process, a school should make sure that students who learn quickly are allowed opportunities to show their growth in knowledge or skills after instruction is given. This is because gifted and talented children who may not understand a concept during a pre-assessment will often pick it up quickly in relation to their peers (MacFarlane, 2018).

Recommendations for Future Research

This study yielded some implications for future research. These recommendations would help independent schools better understand and meet the needs of their high-ability girls in middle school. First, how the combination of genders of the Head of School and Head of Middle School (i.e., male/male, male/female, female/female) correlate and connect to: A) the characterization and identification methods of; B) resources, structures and supports; C) training in instructional practice and professional development; and D) barriers for high-ability girls ought to be further explored.

Another implication for research is to further understand how the school's grade configuration (e.g., K-6, K-8, K-12) also correlates or connects to items A-D above.

More research should be conducted to understand the biases of educators when identifying high-ability girls as well as any other factors that influence how students are

selected for advanced courses. For example, one teacher mentioned that in his school, it is the parents of boys who advocate for their children to be put in advanced math classes more than the parents of girls. This teacher provided this explanation as to why there is a gender imbalance in the higher-level math courses. Understanding such factors can help schools make less biased decisions in terms of identifying their high-ability girls.

An additional area for research is how teachers who are not from the United States and have relocated here perceive high-ability girls and how these perceptions differ from those who are born and grew up in the United States. Research can include how these teachers' practices within the classroom differ from their American-born and raised counterparts.

The final implication for additional research involves the further understanding and effectiveness of some programs and practices employed by some independent schools to meet high-ability girls' needs. Some of those programs and practices include: the use of collaborative rubrics, single-gender classes, and the Design Thinking method.

Summary

This research study was conducted to identify how, or if, independent schools are catering to the needs of high-ability girls. The analysis of the data supports existing research about some of the differing characteristics of high-ability girls versus high-ability boys (e.g., they are frequently more: voracious readers, intrinsically motivated, skilled at writing, etc.) The study showed that these independent schools are not employing the best practices established as such by current research. Therefore, these schools would benefit

from making sure that all stakeholders have a common and shared definition of giftedness as well as comprehensive identification procedures. While these schools do use some methods and practices proven effective in meeting the needs of high-ability girls, they include more choice in electives and clubs rather than the use of some of the established and researched gifted and talented teaching models (e.g., Depth and Complexity, Multiple Menus, etc.) Independent schools may benefit from using these specific models and providing teacher training on them. This study also demonstrated that professional development and training on the topic of high-ability girls is not provided in these schools. The findings of the study did support existing research on some of the largest barriers for high-ability girls (e.g., desire for perfection, social media messages, etc.) Research shows that passions for high-ability girls wane significantly during their middle school years. Therefore, it is important for independent schools to effectively meet the needs of their high-ability girls to combat this phenomena.

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Notice of Study Expiration

Date: February 20, 2020

Study Title: "High-Ability Middle School Girls in Independent Schools"

Principal Investigator: Maria Arellano

The above referenced study will expire on April 24, 2020. Your study was initially reviewed and approved as expedited or exempt research. As such, there is no requirement for continuing review. However, you are required to submit an "Annual Progress Report" if you intend on keeping the study open for another year. Or, if you are done with your investigation, you are required to submit a "Study Closure and Final Report" in advance of the expiration date. There are new requirements for the informed consent form. If your protocol requires a consent form for continued use, please contact the IRB Office for guidance.

Thank you in advance to your attentiveness,

Michael F. La Fountaine, EdD, ATC, FACSM
Director, Seton Hall University Institutional Review Board