THE RELATIONSHIP BETWEEN SCHOOL-FACILITATED PARENTAL INVOLVEMENT AND ACADEMIC MATH ACHIEVEMENT OF HIGH SCHOOL STUDENTS IN VIRGINIA WHO RECEIVE SPECIAL EDUCATION SERVICES

by

Allison Stein

Liberty University

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

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ABSTRACT

This study examined how school-facilitated parental involvement affects Standards of Learning (SOL) end-of-course exams for high school students in Virginia who are receiving special education services. This study examined test results from the 2012-2013, 2013-2014, and 2014-2015 school years for the Algebra I, Geometry, and Algebra II SOL exams, as well as results from the Special Education Parent Survey from the same school years. All data used in this study was archival data found on the Virginia Department of Education website. A review of the literature revealed there have been many studies conducted on the effects of parental involvement on students without disabilities; however, there were very few studies that examined the effects of school-facilitated parental involvement on academic achievement for students with disabilities, and even fewer studies that examined the variables based on individual disability categories. This study followed a correlational design. The predictor variable in this research was school-facilitated parental involvement scores reported by percentage for each public-school division in Virginia. The criterion variables were the Algebra I SOL, Geometry SOL, and Algebra II SOL pass rates (reported in percentage by each school division) for students who receive special education services for the 2012-2013, 2013-2014, and 2014-2015 school years. The researcher ran a Pearson's *r* statistical analysis to determine if there was any strength and direction of relationship for groups that meet the criteria for a Pearson's *r* analysis, and a Spearman's correlation for groups that did not meet the sample size for the Pearson's *r*. The researcher did not find a consistent relationship between the variables among groups tested.

Keywords: Parental involvement, Individualized Education Plan, IEP, Standard of Learning, math achievement.

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List of Abbreviations

End of Course (EOC)

Free Appropriate Public Education (FAPE)

Individualized Education Plan (IEP)

Individuals with Disabilities Education Act (IDEA)

Least Restrictive Environment (LRE)

No Child Left Behind (NCLB)

Portable Document File (PDF)

School-Facilitated Parental Involvement (SFPI)

Standard of Learning (SOL)

Virginia Department of Education (VDOE)

CHAPTER ONE: INTRODUCTION

Background

An abundance of research validates the influence of parental involvement on academic achievement. However, very little research on this topic has specifically targeted students with disabilities (McDonnall, Cavanaugh, & Giesen, 2010), and there is no effective model for school and parent collaboration for students needing special education services (Burke, 2013). Fan and Chen (2001) found that among empirical studies that examined the relationship between parental involvement and academic achievement, some have found a positive relationship, while others have found no relationship at all. One reason for the inconsistent findings among studies may be that no one universal definition of either parental involvement or academic achievement exists (Fan & Chen, 2001). Fan and Chen stated that definitions of parental involvement range from parenting practices to parents disclosing their hopes for their children in regards to academics, and how parents convey these hopes to their children and the children's educators. However, parental involvement is considered to be such an important factor leading to academic success, that it is one of the main areas targeted by *No Child Left Behind* (NCLB) (McDonnall et al., 2010).

Historically one barrier to parental involvement in schools has been that parents often perceive they are not respected in the Individualized Education Plan (IEP) process. Burke (2013) stated educators may see parents as a hindrance in the IEP process. Further supporting this view is the fact that, historically, the procedural safeguards that are in place heavily favor schools, with parents only succeeding in 28.6% of due process proceedings (Burke, 2013). With the passage of the *Individuals with Disabilities Education Act* (IDEA), schools had to gain parental consent for student evaluations, and inclusion of the parent in development of the IEP

became mandated (Burke, 2013). By involving parents in the development of the IEP, schools not only have the opportunity to help parents better understand the child's disability (Al-Shammari & Yawkey, 2008), schools are also helping to ensure students are receiving the most appropriate services (Burke, 2013). However, beyond the eligibility and IEP process there is some inconsistency with regard to the influence parental involvement actually has on academic outcomes (Fan & Chen, 2001).

"One of the most important components in educational reform is parental involvement" (Mitchell & Hauser-Cram, 2010, p. 488). Parental influence is considered to be such a vital factor to student success that it is addressed in the NCLB act (McDonnall et al., 2010); therefore, schools should be striving to facilitate effective and meaningful parental involvement when developing an IEP for students. Schools should endeavor to work as partners with the parents and allow the parents to feel respected in the eligibility and IEP process (Burke, 2013). When parents are actively involved in the educational planning for their children, they are more likely to help the teacher monitor student progress. By participating in planning, the parents become more knowledgeable about their student's needs and are more able to generalize helpful strategies to other settings in the child's life (Al-Shammari & Yawkey, 2008). Additionally, Al-Shammari and Yawkey (2008) stated schools should target specific demographics of parents of students with special needs as their research indicated students with younger or older parents are less likely to experience parental involvement in school. McDonnall et al. (2010) stated parental involvement in the early grades can be used as a predictor for academic achievement even into later years, with the strongest influence on achievement in grades four through eight, but the effect of the parental involvement was less on math achievement as the student went into higher grades.

Al-Alwain (2014) found a link between student engagement in school and academic outcomes. While there is no direct link to parental involvement and academic outcome, there is a link between parental involvement and student engagement. The most positive type of parental involvement is parental involvement in the school (Al-Alwain, 2014). Parental involvement at the school leads to improved student attitudes, attendance, students feeling safe in the school, and higher rates of rule following (Al-Alwain, 2014). There is also a positive relationship between parental involvement in the school and levels of student engagement. Students who are engaged in school do better academically and have a lower dropout rate. Students can be engaged in school behaviorally, academically, or emotionally. A student with a deficit in one of these engagement areas can compensate with higher levels of engagement in the other areas. One example of this ancillary benefit of student engagement would be a student with a cognitive deficit who struggled to be engaged academically becomes emotionally engaged in school because of the parental support they have in the school. When students have more fun at school, they are likely to become more confident, which can also lead to improved academic outcomes (Al-Alwain, 2014). Huntsinger and Jose (2009) found that even if there are not direct academic outcomes based on parental involvement, there are ancillary benefits such as improved attitudes that may lead to better grades.

Students with disabilities perform poorly in math compared to their non-disabled peers (McDonnall et al., 2010). McDonnall et al. (2010) provided one example of the gap in math achievement between students with disabilities and their non-disabled peers. They found in the 2007-2008 school year, 56% of students with visual impairment scored at or above grade level in math compared to 74% of their non-disabled peers (McDonnall et al., 2010). This deficit in math skills can affect not only an individual student's future earning capabilities but overall

society's competitiveness (Wei, Lenz, & Blackorby, 2012).

When students do not achieve academically in math, it affects not only the individual student, but also society as a whole. In order to gain access into middle class jobs, an individual must have the ability to do math on at least the ninth grade level (Lerman, 2013). Lerman (2013) also stated higher math skills are positively correlated with higher earnings. Between 1968 and 1990 the average wage's return on cognitive skills increased by 50% (Balcar, 2014). This again demonstrated the need for academic success in math in regards to individual earnings over a lifetime.

Lack of math achievement affects society as a whole because it leaves jobs unfilled by United States (U.S.) workers, meaning companies may have to bring workers in from other countries to fill these positions (Capelli, 2015). Eisner (2010) reported the U.S. Department of Labor first reported in 1990 that four of the five identified categories of functional employment skills (for example, information management, resource management, systems behavior and performance, and human and technology interactions) have some level of math skill associated with them. The disparity between students who receive special education services and students in general education is so great in the area of math achievement that in 2009, only 7% of 12th grade students receiving special education services scored at or above proficient on the National Assessment of Education Progress Math Test compared to 28% of their non-disabled peers (Wei et al., 2012).

The research indicates that there are several factors that influence math achievement including the education level of the student's mother and the family's socio-economic status (Wei et al., 2012). However, regarding students receiving special education services, the math achievement gap is not evenly distributed across all disability categories (Wei et al., 2012), nor is

parental involvement evenly distributed across all demographics of parents of students with disabilities.

Parental involvement is considered a key element in ensuring student academic success (McDonnall et al., 2010). Student success in the area of math is vital not only for individual student future financial success (Lerman, 2013), but for society as a whole (Wei et al., 2012). It is important that educators understand any relationship between school-facilitated parental involvement and math achievement for student with disabilities. This understanding can help determine what type of parental involvement is most beneficial for students, as well as what schools need to do to help facilitate the most effective styles of parental involvement.

Problem Statement

There are very few studies that have reported whether school-facilitated parental involvement improves academic outcomes for students with disabilities (McDonnall et al., 2010). The literature also does not specify what the framework for school-facilitated parental involvement should look like or what type of involvement schools should strive to achieve. Although Fishman and Nickerson (2015) discussed an increase in parental involvement through specific teacher invitation to the parent, and through the direct request for parental involvement from the student, their study was limited in scope to a total of 137 well-educated parents from two suburban upstate New York schools, and their findings cannot be generalized to other populations. Al-Shammari and Yawkey (2008) discussed that by facilitating parental involvement, schools have the opportunity to help parents of students receiving special education services become more informed about their child's disability. This information not only helps parents make more informed decisions regarding educational planning, but also can improve partnerships between parents and teachers (Al-Shammari & Yawkey, 2008). Research clearly

indicates that there is a gap in math achievement between students receiving special education services and their non-disabled peers (McDonnall et al., 2010). The research also indicated parental involvement, particularly in the early grades, leads to improved academic outcomes. However, their research did not specifically address special education populations (McDonnall et al., 2010). The problem is that there is very little research on the effect of parental involvement for closing the achievement gap for students with disabilities in the area of math achievement (McDonnall et al., 2010).

Purpose Statement

The purpose of this study was to determine if any relationship exists between a school's facilitated parental involvement scores and the Algebra I, Geometry, and Algebra II Standards of Learning (SOL) exam scores of high school students who receive special education services in Virginia. By examining archival data that identifies scoring of parental reports of school-facilitated parental involvement and the Algebra I, Geometry, and Algebra II SOL scores for students who receive special education services, the researcher determined there was not a relationship between these variables. The predictor variable, school-facilitated parental involvement, is defined by the Virginia Department of Education (VDOE) as arranging meeting times when it is convenient for parents, informing parents of their parental rights, encouraging parents to attend meetings and to participate in planning (VDOE, 2002). Likewise, Xu and Filler (2008) defined this variable as school-created activities intended to create parental involvement, generally giving the parent limited power. Parental involvement scores were measured by the Special Education State Performance Report Indicator 8. The criterion variables were Algebra I, Geometry, and Algebra II SOL exam scores, which are defined as end-of-year or end-of-course tests that contain 35 to 50 items or questions that measure content knowledge, scientific and

mathematical processes, reasoning, and critical thinking skills (VDOE, 2012a).

Significance of the Study

This study may help to determine if improving school-facilitated parental involvement can help close the math achievement gap between students, who receive special education services and participate in the Algebra I, Geometry, or Algebra II SOL exams and, their non-disabled peers. There is very limited research on the effects of parental involvement on academic success of students who receive special education services. Since parental involvement is mandated by the NCLB act (McDonnall et al., 2010), schools should be striving to learn the effect of parental involvement as well as what types of involvement are most meaningful. By including parents in the IEP and eligibility process, students with disabilities should be receiving the most appropriate services (Burke, 2013). Additionally, schools would benefit from understanding the effects of parental involvement on student achievement as well as understanding what parents consider a meaningful involvement opportunity to be.

Fishman and Nickerson (2015) found in their study of 137 upstate New York families of students with special education needs that the only significant indicators to facilitate parental involvement were specific teacher invitations as well as specific requests from the student. Fishman and Nickerson also found that parents were less likely to be involved at home if they felt that the school was more welcoming of involvement. According to Fishman and Nickerson, parents may have a diminished feeling of needing to supplement the student's school experience at home. Fishman and Nickerson referred to Fan and Chen (2001) in their discussion that one of the most important factors of parental involvement to affect student achievement is the parental attitude toward education. However when it comes to measuring academic outcomes, in the existing empirical research, Fan and Chen found that there were no consistent findings regarding

the impact of parental involvement on academic achievement. Since there are very few studies that discuss any relationship between school-facilitated parental involvement and improved academic outcomes for students with disabilities (McDonnall et al., 2010), it is vital that more research be conducted in this area. One limitation of the Fishman and Nickerson study is that their findings may not be able to be generalized to communities with different socio-economic statuses and demographics because the parents who participated in that study are more highly educated than the general public. Evidence does exist to show that when initial parental involvement is present in earlier grades, parental involvement is more likely to have a positive effect on academic outcomes than when initial parental involvement is in middle school years (McDonnall et al., 2010).

Research Questions

RQ1: Is there a relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ2: Is there a relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ3: Is there a relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores for high school students receiving special education services in Virginia?

Definitions

1. *Accommodations:* Adaptations that allow students with disabilities to more readily access the general curriculum without modifying the curriculum (Fenell et al., 2013).

2. *Achievement gap*: Any noteworthy and ongoing inequality in educational achievement between different groups of students (Abbott, 2014).
3. *Free and Appropriate Public Education (FAPE):* Every student under IDEA is entitled to a free education that is appropriate to meet that student's individual needs (Fenell et al., 2013).
4. *Individualized Education Program (IEP):* The document which outlines the education plan for a student with disabilities including goals, accommodations and transition information, along with other components (Fenell, Gilchrist, Katz, Kilpatrick, & Makofsky, 2013).
5. *Individuals with Disabilities Education Act (IDEA):* The law which guarantees students with disabilities a public education regardless of their disability, and makes it illegal for a public school to turn a student away based on that student's disability (Fenell et al, 2013).
6. *Least Restrictive Environment (LRE):* Every student with a disability must be educated in a school environment that is as close to the general education setting as is feasible for that student (Fenell et al., 2013).
7. *Modifications*: Adapting the curriculum and expectations to allow a student with disabilities access to the general curriculum (Fenell et al., 2013).
8. *No Child Left Behind (NCLB)*: A 2001 law that increased the federal government's role in ensuring school accountability for academic outcomes for all students in all sub-groups (Klein, 2015).
9. *School-facilitated parental involvement*: The Virginia Department of Education (2002) defined school-facilitated parental involvement as arranging meeting times when it is convenient for parents, informing parents of their parental rights, and encouraging

parents to attend meetings and participate in planning. Xu and Filler (2008) defined school-facilitated parental involvement as school created activities intended to create parental involvement generally giving the parent limited power.

10. *Virginia Standards of Learning (SOLs)*: Student minimum expectations for achievement in learning for K-12 in Virginia (doe.virginia.gov/testing).

CHAPTER TWO: LITERATURE REVIEW

Overview

This chapter will focus on the current literature that discussed parental involvement, school-facilitated parental involvement, and how parental involvement affects math achievement for students with disabilities. Also discussed is the achievement gap in math between students with disabilities and their non-disabled peers. The theoretical framework shaping this study consisted of two theories. The first theory was Albert Bandura's Social Cognitive Theory in regards to adaptation and change and how individuals believe that their actions can influence outcomes in a given situation (Kessler, 2013). The other theory shaping this study was Pierre Bourdieu's Theory of Social Class, which stated society is broken down into different classes, or spaces, and that a person can only be in one space (or class), and that people are defined by their position in that space (Bourdieu, 1985).

The Virginia Department of Education (VDOE, 2002) defined school-facilitated parental involvement as arranging meeting times when it is convenient for parents, informing parents of their parental rights, and encouraging parents to attend meetings and participate in planning. School-facilitated parental involvement was defined by Xu and Filler (2008) as activities intended to create parental involvement generally giving the parent limited power, which has perimeters set by the school. The parents are generally expected to go along with both existing and suggested programming at the school. Parental involvement is considered to have such a high impact on student success, that congress mandated parental involvement in the Individuals with Disabilities Education Act (IDEA) to include consent for assessment, as well as plan development for student with disabilities (Burke, 2013).

Theoretical Framework

Social Cognitive Theory

The first theory framing this study was Albert Bandura's Social Cognitive Theory, which was founded upon the concepts of human development with regard to adaptation and change, and purports that individuals believe that their actions influence outcomes (Kessler, 2013). However, individuals do not have influence over all of the conditions that affect their lives. When this occurs, the individual will work through others to get what he or she wants (Kessler, 2013). Kessler (2013) gave the example of children working through their parents to get something that they would not be able to obtain for themselves. Bandura (1991) stated people develop ideas of what they can accomplish based on past situations, decide the outcomes for various actions, and then make a plan. If people did not believe that they could influence outcomes for themselves, they would not likely take any action to facilitate certain desirable changes. The degree to which individuals believe that they can affect change in their lives determines whether an individual is an optimist or a pessimist (Kessler, 2013). If external forces strictly drove behavior, goals would constantly be changing based on what was happening around the individual. Instead, the individual has reflective thought, which gives some control over the motivation behind the desired change (Bandura, 1991).

Desired outcomes motivate an individual's actions. If there is no external reward for values an individual holds, that individual will need to either rely on self-approval or change an action or goal (Kessler, 2013). Rodriguez, Blatz, and Elbaum (2014) discussed this idea in their seventh theme of parental involvement, which implies that the more experience a parent has in educational law and available services, the higher their expectations become for the school. In other words, the more successful a parent has been in securing services and accommodations in

the past, the more impact they feel they can have in future interactions with the school. Kessler (2013) argued students and parents have pre-conceived ideas of what an outcome will be in a given situation based on past actions and outcomes. These past outcomes will dictate future actions in similar situations. Ross, Bruce and Scott (2012) stated self-efficacy can be used to account for changes in self-confidence, which in turn coincides with changes in achievement, and that when students' achievement improves or parents are successful in getting a desired outcome, they see themselves as having more ability.

The Social Cognitive Theory applies to the question about whether there is a relationship between the rate of school-facilitated parental involvement and pass rate on the Algebra I, Geometry and Algebra II, end-of-course Standard of Learning (SOL) exams. The Social Cognitive Theory stated individuals believe that their actions can influence outcomes of a given situation, and if individuals cannot get what they want via their own actions, they will get help from someone who can help facilitate their desired outcome (Kessler, 2013). With this in mind, parents use what influence they have to help ascertain what they think is best for their student. They participate in parental involvement activities based on their education level and socio-economic status (Rehm, Fisher, Fuentes-Afflick, & Chesla, 2013). Parents also use past experiences with the school to help determine future courses of action based on the outcomes they believe their actions will bring about (Kessler, 2013).

Theory of Social Class

The second theory framing this study was Pierre Bourdieu's Theory of Social Class, which stated society is broken down into different classes, or spaces, and that a person can only be in one space (or class), and that people are defined by their position in that space (Bourdieu, 1985). Each class has specific properties, such as access to material goods or social capital that

each member of that class has by association with that class. This capital gives class members a power that determines their likelihood of success in certain situations (Bourdieu, 1985). Bourdieu described the following three types of capital: economic, social, and cultural (Joppke, 1986). Economic capital is the acquisition of material goods and was formerly how families transmitted power from one generation to the next. Social capital is membership in certain groups and using that membership and the relationships through that membership to improve individual position. Cultural capital is the use of knowledge as a resource to improve the position of an individual or group within the class structure (Joppke, 1986). Gartman (2012) described Bourdieu's society of classes, where classes are divided and given various levels of power based on symbolic differences thus making some classes superior to others.

McKnight and Chandler (2012) discussed that even though schools are officially considered to be class neutral zones, there still exists an imbalance of power among the classes in the school. However, the public school system could potentially be a "true laboratory of democracy" (McKnight & Chandler, 2012, p. 77). This democracy could be taught to the students; however, with regard to parental advocacy, some parents feel that they do not possess the social collateral needed to secure the services from which their student may benefit. McKnight and Chandler explained Bourdieu's social classes determine why people from different classes act in certain ways, and that their reactions to circumstances are considered to be natural based on their background, class and social capital. The theory of social classes applies to the question of whether there is a relationship between the rate of school-facilitated parental involvement and pass rates on the Algebra I, Geometry, and Algebra II end-of-course SOL exams, because parents' perceived social class determines the level of involvement parents have in their child's school as well as the methods they use to advocate for their child. The

parents' social class can be based on one of several factors, including their perceived cultural knowledge and their perceived social capital (Turney & Kao, 2009).

Parental Involvement

McDonnall et al. (2010) found that parental involvement in the early grades could be shown to predict higher student achievement. The strongest link found between higher mathematical achievement and parental involvement is for students in grades one through five; however, there was some achievement carryover into high school among students whose parents were involved in the student's school at the elementary level. There was no link found between mathematical achievement and initial parental involvement in the middle school years and there was no link found between parental involvement and mathematical achievement when the parental involvement was strictly in the home. Among students from numerous categories of disabilities, Fishman and Nickerson (2015) found that specific teacher invitation to the parent as well as specific requests from the student for homework help was the biggest indicator of parental involvement among well-educated parents from suburban upstate New York schools. Fishman and Nickerson additionally found that parents from this demographic might have been sending a very specific positive message to their children regarding the importance of a good education (Fishman & Nickerson, 2015).

Types of Parental Involvement

Epstein (1995), Haley, Ingalls and Martin (2013), and Rehm et al. (2013) all described types of parental involvement and advocacy, and Rodriguez et al. (2014) described eight themes of parental involvement. Rehm et al. cited Lutenbacher, Karp, Ajero, Howe and Williams (2005) when they defined the function of parental advocacy as "(a) advocating for the services to meet the child's needs; (b) acting as an expert on their own child; and (c) protecting the child

from incompetent or uninformed professionals.", and ensuring that the child is working with highly qualified professionals" (p. 1378). Rehm et al. also stated 65% of parents are satisfied with the special education services their children are receiving, and identified three types of parental involvement for parents of students with learning disabilities. These types included high profile parents, strategic parents, and grateful gratifier parents (Rehm et al., 2013). Epstein, Haley et al., and Rehm et al. all agreed and described to some degree one key reason that parents advocate for their child is to ensure that students receive what parents perceive to be the most appropriate services, and to make certain that educators are viewing their students with disabilities as individuals.

High Profile Parents

High profile parents are generally predominately white and highly educated parents. Educators view high profile parents as being demanding, while the high-profile parent tends to view the educators as inept if they do not readily agree to their requests for services for their children (Rehm et al., 2013). High profile parents generally have a reputation within the school community for doing what they feel needs to be done to secure what they believe is best for their child. There is often animosity associated with the relationship between the school and the high-profile parent (Rehm et al., 2013). Some education professionals believe that the high-profile parent is motivated by feelings of guilt or grief, as they often have other children who are much more academically successful (Rehm et al., 2013).

Strategic Parents

Strategic parents try to avoid conflict with school personnel. They choose their battles carefully, and still hold others accountable. Strategic parents are generally willing to compromise, but will threaten legal action if they feel it is necessary. Strategic parents are

generally well educated in the vernacular of special education and use this knowledge to appropriately ask for what they feel is needed (Rehm et al., 2013). These parents work diligently to ensure that teachers and other educational professional follow through on agreed upon services, and hold educational professionals accountable if they do not provide agreed upon services (Rehm et al., 2013). Strategic parents are well educated with about 57% having a college degree. This group of parents is generally known for gathering knowledge and using what they have learned to get what they want. This group contains a larger percentage of parents of students with autism spectrum disorders, as this group of parents generally has a higher rate of expertise on their child's disability than parents of students in other disability categories (Trainor, 2010). One example of their advocacy style is to organize a parent group to influence the school to get what they want for their child (Rehm et al., 2013).

Grateful Gratifier Parents

The final parental style of advocacy described by Rehm et al. (2013) is the grateful gratifier parent. This parent is described as the parent who attempts to appeal to the educator's sense of wanting to make a positive difference in the life of a child. The grateful gratifier parent generally considers the educator to be trustworthy and to have the best interest of the child in mind. These parents maintain personal relationships with the educator and are generally made up of diverse ethnic backgrounds and diverse educational backgrounds; many times the grateful gratifier parent is a first generation American (Rehm et al., 2013). This group comes from diverse socio-economic status households, but often holds common values and beliefs with the educators on what the long-term goals for their child should be (Rehm et al., 2013). Trainor (2010) further supported the point of view of this advocacy style by stating that although parents from lower socio-economic statuses value education as much as parents from higher socio-

economic statuses (SES), the parents from the lower SES tend to trust decision making to the teachers and other school staff and rely on their relationship with the teachers as an advocacy and problem solving tool for services for their child.

Epstein's Styles of Parental Involvement

Another taxonomy of parental involvement styles was developed by Epstein (1995), who stated when schools view the children they serve as children rather than as students, they are more likely to view the parents and the community as partners in education rather than adopting the attitude that parents should parent and leave the education to the professionals. Epstein's view was similar to the historical view discussed by Price-Mitchell (2009) that schools view themselves as autonomous. Epstein described six types of parental involvement styles and techniques that families utilize. These styles of involvement, which include reinforcing at home what the child has learned in school and communicating an expectation of academic success, lead to the following benefits for the students: (a) improved home and school communication, (b) improved and supported parenting skills, (c) parental assisting of student learning, (d) higher rates of parent volunteers, (e) parents advocating for their children, and (f) collaboration among stakeholders (Michigan, 2001).

Epstein (1995) discussed patterns that have been revealed by surveys and field studies. These patterns are as follows: (a) In the higher grades partnerships seem to be less strong than in lower grades; (b) SES plays a role in partnership, and communities with higher SES have stronger partnerships unless the lower income schools have striven to build those relationships; and (c) There is a higher level of parental involvement when parents are given opportunities outside of the regular school day to volunteer. This information has led to the following conclusions: Families overall care about their children and want them to do well in school; and

Although schools strive to improve parental involvement, many schools and administrators are not sure how to involve parents meaningfully (Epstein, 1995).

Epstein (1995) described five steps that schools can take to facilitate strong school, family, and community relationships. These steps include creation of an action team and identification and securing of funding. Other steps are identification of what practices are already in place, construction of a plan to cover specific steps for the first three years, and creation of a schedule by when steps should be completed (Epstein, 1995).

Themes of Parental Involvement

Rodriguez et al. (2014) discussed eight themes related to parental involvement. The first theme discussed school and parent collaboration. Parents, who view their child's school collaboration efforts favorably, stated they felt there was frequent and varied communication, that the school staff was generally accessible, and that they (the parents) felt they could openly disagree with the school about services. This view was different from that of Burke (2013) who described that parents do not feel like equal partners with the school in the IEP process, but instead feel intimidated by the school. Parents who did not view schools' collaboration efforts favorably stated teachers and school staff were not properly trained to work with their child, and that they as parents had to go above the heads of teachers to get the services they felt their child needed (Rodriguez et al., 2014).

The next theme discussed by Rodriguez et al. (2014) was that parental involvement depends on the child's academic progress. The findings on this theme were that if a student is doing well in school and the parents perceive that staff are well trained, they are less likely to be involved at school than parents with children who are performing poorly academically. In this case the parent is more likely to be involved at the school to ensure that all accommodations are

being provided as well as ensuring that the school staff is familiar with the child's IEP. The third theme is parent-initiated involvement, and Rodriguez et al. found that parents of students receiving special education services are often involved in school due to a sense of responsibility. Rodriguez et al. also discussed two-way communication as a theme and, as with their first theme, found that the most positive responses were associated with frequent and open two-way communication. Other themes discussed included parents' trust in schools and past experiences with schools as well as school success with transitions and individual teacher professionalism.

Student engagement. Parental involvement leads to increased student engagement, and it has been found that students who are more engaged at school have more positive academic outcomes (Al-Alwain, 2014). Al-Alwain (2014) proposed a model of how parental involvement directly impacts three facets of student engagement including behavioral, emotional, and cognitive engagement. Al-Alwain reported parental involvement at the school resulted in student engagement being affected in the following ways: Students are (a) less likely to act out in undesired behaviors, (b) are less aggressive, (c) have fewer absences, and (d) follow school rules more consistently than the students whose parents are not involved. When there is parental involvement at the school including activities or conferences, students become more accountable for their behavior (Al-Alwain, 2014). This engagement in turn results in an indirect impact of academic performance. Al-Alwain also suggested different types of engagement may lead to improved outcomes in different areas. Al-Alwain reported that while one facet of student engagement may help prevent school dropout, another type of engagement leads to improved academic outcomes, and that students assume more responsibility for their behavior when their parents are involved in school.

Self-efficacy. Rodriguez et al. (2014) discussed parental involvement in regards to self-

efficacy of the parent and stated that parents who have a higher rate of self-confidence are more likely have higher incidences of parental involvement regardless of whether or not the school actively facilitates parental involvement. In addition to self-efficacy, Rodriguez et al. stated the parents' perception of the adequacy of the child's education experience is also a factor in determining parents' likelihood of school involvement. The less adequate the parents perceive a child's school, the higher the likelihood of parental involvement. However, for parents of children who are receiving special education services, Rodriguez et al. found overall less involvement in both the school setting and the home setting and stated this may be because these parents feel that they are less likely to have a positive impact on their child's academic outcomes.

Communication. Schools should facilitate meaningful two-way home and school communication. This communication should include conferences at least once a year, assistance for non-English speaking families, and other scheduled communications such as progress reports, as well as communication on an as needed basis (Michigan, 2001). This idea coincides with Rodriguez et al.'s (2014) first theme of parental involvement, where parents rated schools more highly when there is frequent, varied two-way communication between the school and home.

Recruit and organize parents. Schools should strive to establish a parent volunteer program for helping in the classroom and should make parents aware of volunteering needs and opportunities. This communication could be through an annual letter to homes, identifying what volunteer opportunities are available and what the expectation would be (Michigan, 2001). This written communication supports Fishman and Nickerson (2015), who found that specific invitations as well as teacher encouragement of students to ask parents for homework help

improved parental involvement.

Information. Schools should provide information about how parents can help their children at home, as well as reviewing the skills that are needed to help their children. Schools should send home reminders of homework policies and facilitate parental involvement for setting goals for students. Schools can also encourage parents to read with their student at home, guide television viewing and take trips in the community, all of which have been found to have a positive effect on academic outcomes (Michigan, 2001).

Linking parents to community resources. Schools should strive to establish active Parent Teacher Organizations (PTOs) as well as actively seek parents to serve on a variety of committees. Schools should work to link parents with advocacy groups as well as other community services (Michigan, 2001). This encouragement would also help to alleviate feelings of inequality between the parents and the school in the IEP process as described by Burke (2013).

Schools should work to link with community and other stakeholder resources to improve school programs. Schools should also provide families with information about community resources and community programs (Michigan, 2001). Schools should provide training to parents of students with disabilities about what supports are available for the students and their families. This information not only improves academic outcomes for the student but increases parental knowledge about the disability (Al-Shammari & Yawkey, 2008).

Cultural Influences on Parental Involvement

Although parental involvement at school was found to have the highest level of influence on student academic outcome (Al-Alwain, 2014), Huntsinger and Jose (2009) found that there are also ancillary benefits to parental involvement in the home such as improved attitude toward

school and motivation for students to do well in school when their efforts were supported at home. Huntsinger and Jose found that parental involvement and attitude toward school is cultural. Their research found that American parents are more likely to complain that the teachers are too hard on the students or expect too much from the students. This attitude is different from the Chinese culture where parental teaching is considered important and is believed to lead to higher academic achievement in the early school years (Huntsinger & Jose, 2009). Additionally, cultural factors play a part in parental involvement in our society. Parents of minority children are often not sure of what they can do to participate in a way that would be considered valuable by the school (LaRocque, Kleiman & Darling, 2011). Teachers overall report a lack of training in how to get parents involved in schools and report that they have a larger skill set in dealing with difficult parents rather than how to effectively utilize parents who want to be involved (LaRocque et al., 2011). Moreover, with the overrepresentation of minority students in special education, it is vital that these parents are involved; however, LaRocque et al. (2011) reported these parents are the least likely to participate in parental involvement activities. This lack of participation may be due to uncertainty about how to be effectively involved as well as more frequent instances of work-related time conflicts. When parents are able to participate in meetings or conferences, their input is more likely to be discounted because they are considered by the teacher to be uninvolved in their child's education.

Effects of Parental Involvement on Class Grades

Fan and Chen (2001) established that the strongest indicator of the relationship between parental involvement and academic achievement was in global indicators such as the student's grade point average (GPA). This relationship was not as strong in single academic subject grades. Cromwell, Mustard and Van Parys (2013) found that there is often a disparity between

teacher's assigned grades and standardized test outcomes, which according to Scheiber, Reynolds, Hajovsky and Kaufman (2015) may also be due to gender differences. This difference in grades supports Fan and Chen's statement that the GPA is a more concise indicator of the positive influence of parental involvement. The disparity between teacher-assigned grades and standardized test scores starts in Kindergarten and becomes larger throughout grade school and tends to be higher based on gender rather than race (Cromwell et al., 2013). Brennan, Kim, Wenz-Gross, and Siperstein (2001) found that there is a disparity in middle school math and English grades and although girls earned higher class grades in math than boys, female students passed the eighth grade Massachusetts standardized math test at a lower rate than male students.

Educators should become cognizant of the relationship between parental involvement and math achievement particularly with regard to students with disabilities and their achievement gap in math compared to their non-disabled peers (McDonnall et al., 2010). According to Wei, Lenz, and Blackorby (2012), for students in the general education population, gender, race, and socio-economic status were found to play a role in mathematic achievement. For students receiving special education services, little or no research was available that looks at the influence of these factors on their mathematic achievement

When students have poor math achievement, they not only have lower individual learning capacity, but also it affects societies' overall global competitiveness (Wei et al., 2012). This lower earning potential is because 80% of identified functional employment skills have some math associated with them (Eisner, 2010); therefore, without basic math skills individuals will not have access to jobs associated with the middle class (Lerman, 2013). Test results do show that among students with disabilities, only 7% of 12th grade students scored at or above proficient (compared to 28% of non-disabled students) on the 2009 National Assessment of

Education Progress Math Test (Wei et al., 2012). Factors found to affect math achievement include the education level of the student's mother and the family's income level. The research that is available does show that among students with multiple disabilities, white male students from higher SES families have higher and faster rates of math achievement than their less advantaged peers (Wei et al., 2012).

Barriers to Parental Involvement

Fishman and Nickerson (2015) found two avenues for increasing parental involvement; however, their study was very limited and the demographics were not representative of most public schools. Furthermore, the parents in Fishman and Nickerson's study may not have experienced the same barriers described by Burke (2013). According to Burke, several barriers to parental involvement in the IEP process include parents not feeling like equal partners, and the procedural safeguards that are in place unfairly favor the schools as evidenced by the fact that parents on average only prevail in 28% of due process proceedings. When schools actively facilitate parental involvement, particularly in the IEP process, schools have the opportunity to help parents better understand a child's disability, which may lead to better academic outcomes (Al-Shammari & Yawkey, 2008). When parents have a better understanding of a child's disability, they are better able to help that child become a productive citizen, and information in the earlier years helps to alleviate potential problems in later years (Al-Shammari & Yawkey, 2008).

Al-Shammari & Yawkey (2008) also found that the level of parental involvement was an indicator of parental understanding of a child's disability, and that well informed parents can give meaningful feedback to teachers about how students with disabilities are generalizing what they have learned in school to other settings in the child's life. This view of the school educating

the parent is in contrast to Burke (2013), who favored a more collaborative effort between the parent and the school, where the parents are more of a partner with school rather than being educated by the school. Burke stated many parents may not feel respected in the IEP process. This sense of lack of respect may become more apparent if the school is taking the lead role in the IEP meeting and teaching the parents about a child's disability. Furthermore, even though there is an abundance of research on the topic of the influence of parental involvement on academic achievement, there is still no effective model for parent and school collaboration for students needing special education services (Burke, 2013).

Implications of Parental Involvement

Historically one barrier to parental involvement in schools has been that parents often perceive that they are not respected in the Individualized Education Plan (IEP) process (Burke, 2013). Burke (2013) stated educators may see parents as a hindrance, their input unimportant, and that the procedural safeguards that are in place heavily favor schools. With the passage of the *Education for All Handicapped Children Act* in 1975, public schools were mandated to find a way to educate all children with disabilities with a free and appropriate public education in the individual child's least restrictive environment (Burke, 2013). With the passage of the 2004 update to the IDEA, schools had to gain parental consent for student evaluations, additionally, the inclusion of the parent in development of the IEP became mandated (Burke, 2013).

Burke (2103) reasoned the use of special education advocates would bring together the two main influences of working with children with special needs (the teachers and the parents). Additionally, the use of special education advocates would also help elevate the limited power that parents have as stated by Xu and Filler (2008), allowing parents an educated voice to express what programming they think would be best for their student rather than simply agreeing

with the school as expected. Burke stated the teachers receive their training and skills at the university level and parents and families get their training through community agencies. In his study, Burke examined two models for training special education advocates.

Al-Shammari and Yawkey (2008) found that the more parental involvement there was for a child with special education needs, the better the academic progress was for that child. Turney and Kao (2009) described parental involvement in school as social collateral. Turney and Kao found in their study of immigrant parents and children that parental involvement not only serves to socialize children, but also allows the parents get to know the school administrators as well as other parents. Parents who are present at the school is more likely to be aware if their child is having a problem and therefore more likely to intervene (Turney & Kao, 2009). This view was supported by Price-Mitchell (2009) who stated schools are traditionally viewed as self-sufficient in regards to educating students, and any partnership with parents was seen as helping parents from lower socio-economic statuses assimilate in the middle class. However, the research has indicated children in special education programs with very young or very mature parents had a lower rate of parental involvement and that schools should be targeting these demographics of parents to increase parental involvement for this population (Al-Shammari & Yawkey, 2008).

By involving parents in the development of the IEP, schools have the opportunity to help parents to better understand their child's disability (Al-Shammari & Yawkey, 2008). This inclusion of parents in the IEP and eligibility process should also ensure that students are receiving the most appropriate services (Burke, 2013). Beyond the eligibility and IEP process, research reflects some inconsistency with regard to the influence that parental involvement actually has on academic outcomes (Fan & Chen, 2001). Fan and Chen (2001) stated some empirical studies show a positive relationship between parental involvement and academic

outcome, while others studies showed little or no relationship between these variables. Fan and Chen indicated one possible reason for the discrepancy might be a lack of consistent definitions of the variables of parental involvement and academic achievement among studies.

Bobbett (as cited in Fan & Chen, 2001) reported data from the *Nevada Report on High Schools* that found there was a minimal and sometimes negative impact from parental involvement on academic achievement. In the Bobbett (1995) report, the state of Nevada used parental attendance at parent-teacher conferences as the measure of parental involvement and found that out of 23 facets of school success measured, parental involvement negatively impacted three, positively impacted four, and 16 were not impacted at all by that particular measure of parental involvement. Bobbett (1995) also concluded these findings may have been different if other measures of parental involvement had been used - such as parents helping with homework, enrichment activities facilitated by the parents, and other parent teacher communication. Fan and Chen stated there was a positive relationship between the SES of a family and the likelihood of the parents being involved at the school. This is similar to the findings of Fishman and Nickerson (2015) who found that specific invitation to be involved at school, as well as children asking parents for homework help, had a very high impact on parental involvement rates of highly educated parents in upstate New York. If there is a relationship between SES and parental involvement, then some of the academic benefits of parental involvement may be attributed to the SES of the family (Fan & Chen, 2001).

Kessler (2013) stated the social cognitive theory looks at human development with regard to adaptation and that as individuals we believe that we can influence. If individuals do not believe that they can influence the outcome on their own, they will work through others to get what they want (Kessler, 2013). This can influence how parents advocate for services they

believe their child may need. Rehm et al. (2013) identified the "grateful gratifier" parents as a type of parental involvement where parents develop relationships with school personnel in order to gain specific services or accommodations the parents feel is vital for their student's success (p. 1383).

Parental influence is considered to be such a vital factor to student success that it is addressed in NCLB. Therefore, schools should be striving to facilitate effective and meaningful parental involvement when developing an IEP for students receiving special education services (McDonnall et al., 2010). Additionally, as parents become more involved in the IEP and eligibility process, they become more knowledgeable of the process and therefore demand more of the schools (Rodriguez et al., 2014).

School Expectations Regarding Parental Involvement

Although IDEA mandates and NCLB focus on parental involvement and consent in both the eligibility process and the planning process for children with disabilities to help ensure they receive the most appropriate education, there are several barriers that tend to prohibit collaboration among all members of a student's IEP team (Burke, 2013). These barriers include parental feelings of intimidation by the school staff (instead of feeling like they are partners with the school staff), procedural safeguards that unfairly protect the schools, and parents' feelings of inferiority to school staff in regards to being experts on working with children with disabilities (Burke, 2013). However, Burke (2013) indicated increased parental involvement leads to higher academic achievement, lower dropout rates and better attendance. Therefore, schools should strive to identify the types of parental involvement that lead to specific academic success. Schools should also focus on types of student engagement described by Al-Alwain (2014), such as better attendance, lower drop-out rates, and better adherence to school rules. Price-Mitchell

(2009) stated, before NCLB and IDEA, schools traditionally were viewed as self-sufficient with regard to educating students, and any partnership with parents was seen as helping parents from lower SES assimilate into the middle class.

Al-Shammari and Yawkey (2008) discussed how involving the parent in the planning process gives educators a chance to improve parents' knowledge about their child's disability. By improving parents' knowledge of a student's disability, the parents can better work with the child individually and have more meaningful input into the educational plan, as well as a better understanding of realistic outcomes (Al-Shammari &Yawkey, 2008). Furthermore, knowledgeable parents can be beneficial in the education process by monitoring that the teacher is carrying out what is in the IEP, such as ensuring students are getting modifications or access to accommodations. Informed parents can also report how a student is progressing in other settings outside of school and if skills learned in school are being generalized into other settings in the child's life (Al-Shammari & Yawkey, 2008). This reporting can more accurately indicate a student's overall educational progress. This approach is more of a partnership between school staff and the student's parent. Reversely, a lack of cooperation between parents and school personnel can cause lower academic achievement and higher incidences of unwanted behavior issues in high school students (Al-Alwain, 2014).

Special Education

Mathematical Achievement

Although there was an abundance of research that discussed the influence of parental involvement on academic achievement, very little research on this topic has specifically addressed students who receive special education services (McDonnall, Cavanaugh & Giesen, 2010). In the 2007-2008 school year, 56% of students receiving special education services for

visual impairment, scored at or above grade level in math compared to 74% of their non-disabled peers (McDonnall et al., 2010). The disparity between students who received special education services and general education students was so great in the area of math achievement that in 2009 only 7% of 12th grade students receiving special education services scored at or above proficient on the National Assessment of Education Progress Math Test compared to 28% of their non-disabled peers (Wei, Lenz, & Blackorby, 2012). The proportion of disabled students also requiring services in mathematics varies greatly. On the low end, 22% of students requiring speech services also have a math disability, while 84% of students receiving services for multiple disabilities also have a math disability (Wei et al., 2012).

Per Wei et al. (2012), there are no clear math trajectories for students with disabilities. However, there was no measure of the math achievement gap based on the individual disability category (Wei et al., 2012). When studying math achievement in students with disabilities, all defined disability categories need to be examined individually (Wei et al., 2012). Current research generally looks at one or two disability categories and has a small sample size ranging from a few students up to a few hundred students, making it unlikely that any findings can be generalized across larger populations (Wei et al., 2012). Overall, students with speech impairment and visual impairment showed the highest math achievement among students with disabilities, with an average of 11.85 points scored higher on tests of math achievement compared to students being served under the category of learning disabilities (LD). Students with multiple disabilities showed the lowest math achievement, scoring 40.64 points lower on achievement testing than students receiving special education services for LD (Wei et al., 2012). McDonnall et al. (2010) reported in the 2007-2008 school year, 56% of students receiving special education services for visual impairment, scored at or above grade level in math

compared to 74% of their non-disabled peers.

Pappano (2014) stated one reason there was such a disconnect with math across all populations of students was because many students equate doing well in math with being able to complete all math problems quickly, yet there was no relationship between math problems that are presented in class and how students use math in their world (Pappano, 2014). Pappano also discussed that culturally there is a narrow definition of what math success looks like and who is successful in math. If students are unable to calculate simple problems such as which of two choices is a better value, they will not see the value of learning a math skill (Pappano, 2014). Pappano used the phrase "more thinking, less doing" to emphasize that students should be more worried about the uses of math rather than simply solving problems (p. 3).

A deficit in math skills not only affects an individual student's future earning capabilities, but also can affect society's competitiveness (Wei et al., 2012). Lerman (2013) stated that in order to have access to most middle-class careers, students must be able to perform math on at least the ninth grade level. For most students in Virginia, ninth grade math is Algebra I. Capelli (2015) discussed the 1997 U.S. Department of Commerce report, which stated there is such a shortage of Information Technology (IT) workers in the United States that the United States must employ individuals by either bringing them to the United States from other countries or outsourcing work (Capelli, 2015). Balcar (2014) discussed the findings of Bacolod and Blum (2008), which stated wage returns based on cognitive skills increased 60% between 1968 and 1990. Eisner (2010) stated the U.S. Department of Labor first reported in 1990 that four of the five identified categories of functional employment skills (e.g. information management, resource management, systems behavior and performance and human and technology interactions) all have some level of math skill associated with them.

Jones, Wilson and Bhojwani (1997) stated there are six factors affecting students with disabilities. These six factors are: (a) prior achievement, (b) students' sense of autonomy, (c) curriculum content, (d) instructional delivery, (e) teacher's reflective instruction, and (f) teacher's belief in instruction efficacy. One way to close the achievement gap between students with disabilities and their non-disabled peers in secondary school, according to Jones et al., is to improve math education for students in elementary school where there is more emphasis on teaching rudimentary math skills.

Among students with disabilities, student math achievement is also affected by gender, race, and socio-economic status (Wei et al., 2012). Black students with disabilities have consistently lower math achievement than white students with disabilities, and Hispanic students with disabilities scored similarly to white students with disabilities on tests of calculation at age 12.67, but the gap grew wider as students progressed through higher grades (Wei et al., 2012). This information coincides with the findings of McDonnall et al. (2010), who found that as students progressed through higher grades, the effects of parental involvement of math achievement diminished. Additionally, Wei et al. (2012) found that the education level of the mother showed to positively affect math achievement, while the father's education level did not generally affect overall achievement in math, but it did positively affect math calculation scores (Wei et al., 2012).

Schools should help parents establish supportive home environments. These efforts should be done through parental education, home visits, and linking families with additional community services (Michigan, 2001). Educators also need to strive to define exactly what constitutes a math disability. According to Wei et al. (2012) research in math disability is still in the very early stages although it is agreed that a math disability may include difficulties in

computational skills, long term and working memory, insufficient computation skills, and poor choice of math strategies (Wei et al., 2012). One step that would help facilitate identifying and understanding math disabilities would be if educators could identify a reliable math trajectory for students with different ability levels (Wei et al., 2012). Furthermore, parental involvement may help these students; however, there is no effective model for school and parent collaboration for students needing special education services (Burke, 2013).

Origin of Current Laws and Regulations

During the last century and a half, there have been many laws put into place to provide for the education of students with special needs. In 1893, the Massachusetts Supreme Court allowed for the exclusion of disabled students from school based exclusively on their academic ability (Esteves & Rao, 2008). Brown v. Board of Education (1954), which is known as the landmark case to end segregation based on race in the public schools, also stated all students regardless of race, gender, or disability have rights to public education. This actually helped to secure monies for students with disabilities, but schools could still turn students with disabilities away (Esteves & Rao, 2008).

In 1965, the Elementary and Secondary Education Act provided specific funding for public schools to provide services for students with special needs (Esteves & Rao, 2008). In 1973, Section 504 of the Rehabilitation Act stated a person with a disability could not be excluded from programs that receive federal government funding. In 1975, the Education for All Handicapped Children Act gave children with disabilities access to public education (Esteves & Rao, 2008). In 1982, the Board of Education Hendrick Hudson Central School Division v. Rowler stated programming for students with special needs must specifically meet the needs of the individual child and be supported by additional services, which help the children to fully

benefit from that instruction (Esteves & Rao, 2008). This ruling also went on to say that students with disabilities are not necessarily entitled to the best programming, but that the most appropriate programming would be determined through an IEP (Esteves & Rao, 2008). In 1990, the *Americans with Disabilities Act* stated that even schools that do not get federal funding must comply with the *Rehabilitation Act* (Esteves & Rao, 2008). In 1997, the *Individuals with Disabilities Education Act* (IDEA) stated students with disabilities would not only have access to public education, but their education services would need to be meaningful and show measurable progress (Esteves & Rao, 2008).

In 2004, mandates for IDEA and the *No Child Left Behind* (NCLB) Act passed, which stated that children with disabilities must participate in statewide testing, and that teachers of students with disabilities must be highly qualified. The purpose of testing participation was to close the achievement gap between students with disabilities and their non-disabled peers (Esteves & Rao, 2008). IDEA also required that an Individualized Education Plan (IEP) be developed for each student receiving special education services and that the student's parent consent to eligibility assessments and is involved in the development of the IEP. These rulings and acts have had a very big impact on public education. Between 1976 and 1990, the number of children being served in special education increased by 23%. In the fall of 2012, the national average for students receiving special education services was 8.4%, with Hawaii having the lowest average of 6.3% and New Jersey having the highest average of 11.6% (Annual Disability Statistics, 2014).

Definition of Disability Categories

The VDOE recognized 13 different disability categories and discussed the impact that a disability may have on a student's education. These categories are divided into cognitive and

physical disability categories. These categories and their potential impact on a student's education, which would make the child eligible for an IEP, are as follows.

Cognitive disabilities. This first of the cognitive disabilities is autism spectrum disorder. According to the VDOE (2015b) a student with an autism spectrum disorder's education may be negatively impacted as a result of the following characteristics: impaired social interactions, communication delays, or restricted or repetitive behaviors. Next is the category of developmental delay. A student who is found eligible for special education services as a student with developmental delay is experiencing delayed development in one or more of key measurement areas of development such as language or adaptive behavior, which cannot be attributed to other factors such as cultural differences (VDOE, 2015b). Children can only be eligible under this category until they are six years of age. The next disability category recognized by the VDOE is emotional disability, which includes depression and anxiety disorders as well as behavioral disorders that may affect the education of the student with the disability or the education of other students in the class (VDOE, 2015b).

The next category of cognitive disability is intellectual disability (formally called mental retardation). The VDOE defines intellectual disability as "significantly sub-average general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period that adversely affects a child's educational performance" (VDOE, 2015b, p.19). Another category is identified as multiple disabilities, which are two or more simultaneously occurring disabilities not including deaf-blindness that cause a severe negative impact on the student's education (VDOE, 2015b). After intellectual disability, the VDOE lists another cognitive disability category as specific learning disability (SLD). SLD is a learning disability, which may affect at least one area of processing for the student and is not

caused by another disability such as hearing or visual impairment (VDOE, 2015b). Lastly is speech-language impairment, which is a communication disorder.

Physical disabilities. Physical disabilities include mobility, health, and sensory disabilities. Students with an educational diagnosis of deaf blindness present with "simultaneous hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness" (VDOE, 2015b). Children who are found eligible under the disability category of deafness has a hearing impairment so severe that it affects their ability to process language (VDOE, 2015b), which is different from the students with hearing impairment who are not deaf, but whose hearing impairment affects them educationally.

Also recognized by the VDOE are the categories of orthopedic impairment, which includes such conditions as cerebral palsy. The category of other health impairment is an umbrella category to include such disabilities as attention deficit disorders, epilepsy, and asthma as well as other conditions that may affect the student's education (VDOE, 2015b). Additionally, traumatic brain injury is a brain injury originating from an external force and results in a deficit of any area of processing or reasoning (VDOE, 2015b). The final physical category is visual impairment or blindness, which is a visual impairment that has a negative impact on a child's educational performance (VDOE, 2105b)

Inclusion

In order for students with disabilities to receive their free appropriate public education (FAPE) in their least restrictive environment (LRE), students with disabilities often participate in classes with their non-disabled peers. Gottfried (2014) addressed the effect of having students

with special needs in classes with their non-disabled peers. Gottfried found that for students without disabilities, having their disabled peers in class leads to learning certain social skills and well as increased understanding of differences among individuals. Furthermore, the reallocation of resources from special education classrooms to general education classrooms may mean additional resources would be available to general education students (Gottfried, 2014). Some of the disadvantages of this inclusion are that students with emotional disabilities are more likely to exhibit inappropriate behaviors, students with disabilities may require more of the teacher's attention, and the rate of suspension for students with disabilities is twice as high as students without disabilities (Huntsinger & Jose, 2009). Huntsinger and Jose (2009) concluded that mainstreaming students with disabilities had non-cognitive outcomes for all students. For the students with disabilities these outcomes were not disability specific. Factors that played a role in cognitive outcomes for both sets of students included the teacher's years of experience and the teacher's experience in special education, including special education coursework (Huntsinger & Jose, 2009).

Advocacy Programs

Burke (2013) discussed how the use of special education advocates might help parents have a stronger voice in the IEP process. In his study, Burke discussed two models for training special education advocates. The first model was Special Education Advocacy Training (SEAT). The SEAT program has three goals. The first goal is to develop and explore the potential usefulness of special education advocacy programs for non-attorneys. This goal has four sub-goals that include: developing and implementing trial runs of different types of training for special education advocates; the reliability of generalizing previously and newly developed programs to serve larger areas; evaluating how successful the program is; and sharing what was

learned (Burke, 2013). The second goal was to test SEAT in three separate areas around the country and the third goal was to conduct a one-year follow-up on areas that were served in the trial. SEAT also addressed seven competencies that included: introduction, laws of special education, principles of special education, advocacy and ethics, basic advocate skills, conflict resolution, and the business of advocacy. These competencies totaled 115 classroom hours to complete the advocacy training (Burke, 2013).

From the SEAT training, individuals who were interested in becoming special education advocates indicated they wanted training so that they could be perceived as being legitimate (Burke, 2013). Additionally, the total number of classroom hours needed to complete the SEAT training may have been a deterrent from certain subgroups participating in the training. There also needed to be a pre-determined admission criteria to the training program, as well as opportunities for the students to practice with attorneys, and an improved evaluation system for the trainees and the implications of a formal advocate certification program (e.g. legal liability) (Burke, 2013).

The Volunteer Advocacy Project (VAP) was the second program explored by Burke (2013). This program had five goals, which included the following elements: facilitating support to families (in additional programs), providing support to families, minimum of four families supported per advocate, continuous improvement of the training model, and research other training programs. From the VAP, researchers learned that an increase of first hand opportunities to practice for advocates as they train is needed (Burke, 2013). Not all advocate trainees have the opportunity to job shadow a working advocate. Most advocacy programs served urban areas but there is a big need for advocacy services in the more rural settings (Burke, 2013).

Summary

Chapter Two presented a review of the current literature discussing math achievement and parental involvement. This chapter discussed the theoretical frameworks of Albert Bandura's Social Cognitive Theory and Pierre Bourdieu's Theory of Social Class and how these theories relate to parental involvement in the schools. This chapter also examined the disability categories as defined by the VDOE as well as origins of current laws which regulate special education, implications of parental involvement and related literature.

Parental involvement is considered to be so important to student success that congress mandated, in the renewal of IDEA as well as in one of the six focus areas of NCLB, parental involvement including consent for assessment, as well as plan development for students with disabilities (Burke, 2013). The VDOE defined school-facilitated parental involvement as arranging meeting times when it is convenient for parents, and informing parents of their parental rights, and encouraging parents to attend meeting and participate in planning (VDOE, 2002). School-facilitated parental involvement was defined by Xu and Filler (2008) as created activities intended to construct parental involvement generally giving the parent limited power. Parental involvement is considered to be such a powerful tool in student achievement that Turney and Kao (2009) described parental involvement as social collateral.

The social cognitive theory looks at human development in regards to adaptation. As individuals, we believe that we can influence outcomes if not on our own, than by working through others to get what they want (Kessler, 2013). This theory becomes evident in what Rehm et al. (2013) identified as the "grateful gratifier" parent, a type of parental involvement and advocacy style in which parents develop relationships with school personnel in order to gain specific services or accommodations the parent feels is vital for their student's success. This

theory is also visible with strategic parents who choose their battle for services based on past experiences (i.e., which staff person they can expect to get the desired result from) (Rehm et al., 2013). This adaptation affects the way parents choose to advocate for their child or the level of involvement the parents feel they are comfortable with in the school.

There was an abundance of research that discussed the influence of parental involvement on academic achievement, but very little research on this topic has specifically targeted students who receive special education services (McDonnall et al., 2010). There is also currently no effective model for school and parent collaboration for students needing special education services (Burke, 2013). Jeynes (2010) stated that even though parental involvement such as shared reading and help with homework as well as school-facilitated parental involvement may have positive impacts on academic outcomes; educators do not know which types of parental involvement have the highest impact rates on these outcomes. Fishman and Nickerson (2015) did find among well-educated parents in New York that specific teacher invitations to the parents, as well as student requests for homework help, were strong facilitators of parental involvement.

While the passage of the *Education for All Handicapped Children Act* (1975) mandated public schools to find a way to educate all children with disabilities with a free and appropriate public education in the individual child's least restrictive environment (Burke, 2013), parents still feel they are not respected in the IEP process. The research supports that parents may be seen as a hindrance and the procedural guidelines that are in place heavily favor schools (Burke, 2013). With the passage of IDEA schools had to gain parental consent for student evaluations and inclusion of the parent in development of the IEP finally became mandated (Burke, 2013). By involving parents in the development of an IEP, schools have the opportunity to help parents

better understand the child's disability (Al-Shammari & Yawkey, 2008). This inclusion of parents in the IEP and eligibility process should also ensure that students are receiving the most appropriate services (Burke, 2013).

There are still issues surrounding the effects of parental involvement on math achievement. Beyond the eligibility and IEP process, there is a great deal of inconsistency in regards to the influence that parental involvement actually has on academic outcomes (Fan & Chen, 2001). Nonetheless, if parental involvement were to lead to increased student engagement, it has been found that students who are more engaged at school have more positive academic outcomes (Al-Alwain, 2014). Huntsinger and Jose (2009) echoed that even if there are not direct academic outcomes based on parental involvement, there are ancillary benefits such as improved attitudes that may lead to better grades. More research needs to be conducted to determine the effect of parental involvement on math achievement for students with disabilities (McDonnall et al., 2010).

CHAPTER THREE: METHODS

Overview

With the passage of the *No Child Left Behind Act*, schools were mandated to involve parents in finding children eligible for special services as well as involving parents in the development of an Individualized Education Plan (IEP) (Burke, 2013). Currently, there is very little research on what impact parental involvement has on academic achievement for students with disabilities (McDonnall, Cavanaugh, & Giesen, 2010). Additionally, there is no clear trajectory for math achievement for students with disabilities (Wei, Lenz, & Blackorby, 2012), and no one standard definition of parental involvement (Fan & Chen, 2001).

The purpose of this study was to determine if any relationship exists between a school's school-facilitated parental involvement score and Standard of Learning (SOL) pass rates for students with disabilities participating in end-of-course math exams. Chapter Three will describe the methods used in conducting this study. This chapter is broken into seven separate sections including; design, research questions, null hypotheses, participants and setting (including sub-groups, instrumentation, procedures for conducting the research, and how the data were analyzed).

Design

This study used a correlational design. This design was selected for this study to determine the direction and strength of the relationship between the variables (Gall, Gall, & Borg, 2007). All data used in this study was archival data from the Virginia Department of Education (VDOE) website. The predictor variable in this research was school-facilitated parental involvement scores reported by percentage for each public school division in Virginia. School-facilitated parental involvement is defined as arranging meeting times when it is

convenient for parents, informing parents of their parental rights, and encouraging parents to attend meetings and participate in planning (VDOE, 2002). The criterion variables were the Algebra I SOL, Geometry SOL, and Algebra II SOL pass rates (reported in percentage by each school division) for students who received special education services for the 2012-2013, 2013-2014 and 2014-2015 school years.

Research Questions

RQ1: Is there a relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ2: Is there a relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ3: Is there a relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores for high school students receiving special education services in Virginia?

Null Hypotheses

$H_0$1: There is no relationship between school-facilitated parental involvement scores and *Algebra I* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$2: There is no relationship between school-facilitated parental involvement scores and *Algebra I* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$3: There is no relationship between school-facilitated parental involvement scores and

Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

$H_0$4: There is no relationship between school-facilitated parental involvement scores and *Geometry* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$5: There is no relationship between school-facilitated parental involvement scores and *Geometry* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$6: There is no relationship between school-facilitated parental involvement scores and *Geometry* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

$H_0$7: There is no relationship between school-facilitated parental involvement scores and *Algebra II* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$8: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$9: There is no relationship between school-facilitated parental involvement scores and *Algebra II* Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

Participants and Setting

The samples used in this study consisted of archival data from 132 public school divisions in Virginia. Within the school divisions are students who received special education

services and have participated in Algebra I, Geometry, and Algebra II math courses, in either the half year or full year format and have taken the corresponding end of course SOL exam in the 2012-2013, 2013-2014 or the 2014-2015 school year. Parent participation scores were obtained from Indicator 8 of the Special Education Performance Report. This report has 14 indicators. Indicator 8 is the percentage of parents within a division who reported school-facilitated parental involvement was utilized to improve services for their student with disabilities (VDOE, 2015a). The data were from archival data reported on the VDOE website annually by each school division. The predictor variable, percent of reported school-facilitated parental involvement, and the criterion variables Algebra I, Geometry, and Algebra II SOL exam pass rates for students with disabilities were obtained here. The sample size is a minimum 66 school divisions per test, per school year sampled, which according to Gall et al. (2007) is the minimum sample size for a medium effect size, with statistical power of .7 and an alpha level of .05. For test samples that did not have a minimum sample size of 66, a Spearman's Correlation was run. The minimum sample size for the Spearman's Correlation was 66 (Gall et al., 2007) for a medium effect size with a statistical power of .7 and an alpha level of .05, and a minimum sample size of 23 for a large effect size with a statistical power of .7 and an alpha level of .05. The school divisions included in this study were from all areas of Virginia and included both urban and rural schools, as well as schools serving students from different socio-economic statuses.

The VDOE recognizes the following 13 different disability categories: autism spectrum disorders, deaf-blindness, deafness, developmental delay, emotional disability, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disability, speech language impairment, traumatic brain injury, and visual impairment or blindness. Pass rates for the Algebra I, Geometry and Algebra II exams did not include students

with developmental delay because students in Virginia can only be found eligible for special education services under this category until the age of 6, at which time they would need to be found eligible for continued special education services. All samples used in this study were for students receiving special education services and participating in general curriculum math classes.

The data samples for the Algebra I SOL exam for the 2012-2013 school year included the following reports by sub groups: all students with disabilities 109, male students 95, and female students 70. Ethnicity included zero divisions reporting for American Indian or Native Alaskan, four reporting for Asian sub-group, 49 reporting for Black, not of Hispanic origin, 14 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, 10 reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 90 reporting for White, non-Hispanic. Reports by individual disability category included two reports for Hearing Impairment, seven for Speech or Language Impairment, 25 for Emotional Disturbance, one for Orthopedic Impairments, 88 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 12 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status included socio-economically disadvantaged no, 75 samples, and socio-economically disadvantaged yes, 91 samples.

The data samples for the Geometry SOL exam for the 2012-2013 school year included the following reports by sub groups: all students with disabilities 99, male students 83, and female students 53 Ethnicity included zero divisions reporting for American Indian or Native Alaskan, five reporting for Asian sub-group, 42 reporting for Black, not of Hispanic origin, 14 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, eight reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 79

reporting for White, non-Hispanic. Reports by individual disability category included one report for Hearing Impairment, five for Speech or Language Impairment, 19 for Emotional Disturbance, one for Orthopedic Impairments, 75 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 10 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 77 samples, and socio-economically disadvantaged yes, 72 samples.

The data samples for the Algebra II SOL exam for the 2012-2013 school year included the following reports by sub groups: all students with disabilities 46, male students 31, and female students 20. Ethnicity included zero divisions reporting for American Indian or Native Alaskan, three reporting for Asian sub-group, 13 reporting for Black, not of Hispanic origin, seven reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, three reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 32 reporting for White, non-Hispanic. Reports by individual disability category included one report for Hearing Impairment, three for Speech or Language Impairment, six for Emotional Disturbance, zero for Orthopedic Impairments, 24 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, five for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 32 samples, and socio-economically disadvantaged yes, 20 samples.

The data samples for the Algebra I SOL exam for the 2013-2014 school year included the following reports by sub groups: all students with disabilities 112, male students 96, and female students 73. Ethnicity groups included zero divisions reporting for American Indian or Native Alaskan, four reporting for Asian sub-group, 46 reporting for Black, not of Hispanic origin, 17 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, 11 reporting on non-

Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 92 reporting for White, non-Hispanic. Reports by individual disability category included two reports for Hearing Impairment, seven for Speech or Language Impairment, 22 for Emotional Disturbance, zero for Orthopedic Impairments, 88 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 13 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 75 samples, and socio-economically disadvantaged yes, 93 samples.

The data samples for the Geometry SOL exam for the 2013-2014 school year included the following reports by sub groups: all students with disabilities 97, male students 81, and female students 53. Ethnicity included zero divisions reporting for American Indian or Native Alaskan, four reporting for Asian sub-group, 40 reporting for Black, not of Hispanic origin, 15 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, eight reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 80 reporting for White, non-Hispanic. Reports by individual disability category included one report for Hearing Impairment, five for Speech or Language Impairment, 13 for Emotional Disturbance, one for Orthopedic Impairments, 70 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 12 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 65 samples, and socio-economically disadvantaged yes, 72 samples.

The data samples for the Algebra II SOL exam for the 2013-2014 school year included the following reports by sub groups: all students with disabilities 34, male students 25, and female students 17. Ethnicity included zero divisions reporting for American Indian or Native Alaskan, two reporting for Asian sub-group, 13 reporting for Black, not of Hispanic origin, six

reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, two reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 24 reporting for White, non-Hispanic. Reports by individual disability category included one report for Hearing Impairment, three for Speech or Language Impairment, five for Emotional Disturbance, one for Orthopedic Impairments, 22 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, seven for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 24 samples, and socio-economically disadvantaged yes, 16 samples.

The data samples for the Algebra I SOL exam for the 2014-2015 school year included the following reports by sub groups: all students with disabilities 115, male students 101, and female students 79. Ethnicity groups included zero divisions reporting for American Indian or Native Alaskan, five reporting for Asian sub-group, 54 reporting for Black, not of Hispanic origin, 21 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, eight reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 91 reporting for White, non-Hispanic. Reports by individual disability category included two reports for Hearing Impairment, six for Speech or Language Impairment, 28 for Emotional Disturbance, zero for Orthopedic Impairments, 92 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 14 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 77 samples, and socio-economically disadvantaged yes, 97 samples.

The data samples for the Geometry SOL exam for the 2014-2015 school year included the following reports by sub groups: all students with disabilities 90, male students 76, and female students 59. Ethnicity included zero divisions reporting for American Indian or Native

Alaskan, four reporting for Asian sub-group, 38 reporting for Black, not of Hispanic origin, 15 reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, seven reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 75 reporting for White, non-Hispanic. Reports by individual disability category included zero reports for Hearing Impairment, three for Speech or Language Impairment, 14 for Emotional Disturbance, one for Orthopedic Impairments, 72 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, 14 for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 66 samples, and socio-economically disadvantaged yes, 71 samples.

The data samples for the Algebra II SOL exam for the 2014-2015 school year included the following reports by sub groups: all students with disabilities 39, male students 23, and female students 17. Ethnicity included zero divisions reporting for American Indian or Native Alaskan, two reporting for Asian sub-group, 11 reporting for Black, not of Hispanic origin, six reporting for Hispanic, zero for Native Hawaiian or Pacific Islander, three reporting non-Hispanic two or more races, zero reporting for unknown race or ethnicity not provided, and 26 reporting for White, non-Hispanic. Reports by individual disability category included one report for Hearing Impairment, two for Speech or Language Impairment, four for Emotional Disturbance, zero for Orthopedic Impairments, 19 for Specific Learning Disability, zero for Deaf-Blindness, zero for Multiple Disabilities, six for Autism, zero for Traumatic Brain Injury, zero for Intellectual Disability. Reports by socio-economic status include socio-economically disadvantaged no, 27 samples, and socio-economically disadvantaged yes, 12 samples. There were no reports for visual impairment with the exception of one school division reporting by visual impairment for the 2012-2013 Geometry SOL.

Instrumentation

Algebra I SOL Exam

Archival data used in this correlational study consisted of Algebra I SOL scores for high school students who receive special education services. The purpose of the Algebra I SOL instrument is to measure content knowledge of Algebra I standards. The Algebra I SOL exam instrument consists of 35-50 items or questions. Achievement is graded on a scale of 0-600 with 400 representing the minimum level of acceptable proficiency and 500 representing advanced proficient on the Algebra I exam (VDOE, 2012a). The instrument was developed to ensure that all students meet the minimum expectations in Algebra I. The Algebra I SOL exam specifically tests for content knowledge after the student has completed the Algebra I course work in either half year or full year format. This knowledge includes knowledge in the areas of: expression and operation, equations and inequalities, functions, and statistics. The minimum expectation for each core subject is clearly outlined in the Standards of Learning curriculum (VDOE, 2012b). Students participating in SOL testing are tested at the end of each semester or school year; there was no time limit for taking the SOL exam, it does, however, need to be completed within the school day.

The VDOE reports the validity of the Algebra I SOL exam using a Cronbach's Alpha Coefficient. Each administration of the Algebra I SOL exam contains three core exams. Each core contains a number of tests with inconsequential variations called forms. Each division is assigned one core (and the corresponding forms). The division also gets one alternate form for students who are testing outside the regular test day for that division. Each division is given one Algebra I core exam from which all Algebra I exams during that administration are derived (VDOE, 2012b). Data was available for the 2011-2012 testing cycle. This data indicated for the

Algebra I SOL exam a Cronbach's Alpha Coefficient for core 1 of α =.91, core 2, α =.89 and core 3, α=.86 (VDOE, 2012b). Warner (2013) stated there is no one agreed upon standard for acceptable measurement reliability. Reliability is dependent upon the situation the data is being used for. For example, reliability for basic research would have a lower acceptable reliability value than tests where results may have significant consequences such medical diagnosis (Warner, 2013). The VDOE referred to deKlerk (2008) who stated that with a range of 0-1 for alpha reliability coefficients, a value of a= 0.7 is considered acceptable and a value of a=0.8 or higher is appropriate for high stakes testing (VDOE, 2012b). All Algebra I core tests meet this requirement. The Algebra I test scoring data is reported by the school division to the VDOE on an annual basis.

Geometry SOL Exam

Archival data used in this correlational study consisted of Geometry SOL exam scores for high school students who receive special education services. The purpose of the Geometry SOL instrument is to measure content knowledge of Geometry standards. The Geometry SOL exam instrument is made up of 35-50 items or questions. Achievement is graded on a scale of 0-600 with 400 representing the minimum level of acceptable proficiency and 500 representing advanced proficient on the Geometry exam (VDOE, 2012a). The instrument was developed to ensure that all students meet the minimum expectations in Geometry. The Geometry SOL exam specifically tests for content knowledge after the student has completed the Geometry course work in either half year or full year format. This knowledge includes: reasoning, lines and transformation, triangles, polygons and circles, and three-dimensional figures (VDOE, 2012a). Students participating in the Geometry SOL exam are tested at the end of each semester or school year; there is no time limit for taking the SOL exam.

The VDOE reports the validity of the Geometry SOL exam using a Cronbach's Alpha Coefficient. Each administration of the Geometry SOL exam contains of 3 core exams. Each core contains a number of tests with inconsequential variations these are called forms. Each division is assigned one core (and the corresponding forms). The division also gets one alternate form, for students who are testing outside the regular test day for that division. Each division is given one Geometry core exam from which all Geometry SOL exams during that administration are derived (VDOE, 2012b). Data was available for the 2011-2012 testing cycle. This data indicates for the Geometry SOL exam a Cronbach's Alpha Coefficient for core 1 of $\alpha = .92$, core 2 $\alpha = .89$ and core 3 $\alpha = .85$. (VDOE, 2012b). The VDOE refers to deKlerk (2008) who stated that with a range of 0-1 for alpha reliability coefficients, a value of 0.7 is considered acceptable and a value of 0.8 or higher is appropriate for high stakes testing (VDOE, 2012b). All Geometry core tests meet this requirement. The Geometry test scoring data is reported by the school division to the VDOE on an annual basis.

Algebra II SOL Exam

Archival data used in this correlational study consisted of Algebra II SOL exam scores for high school students who receive special education services. The purpose of the Algebra II SOL instrument is to measure content knowledge of Algebra II standards. The Algebra II SOL exam instrument is made up of 35-50 items or questions. Achievement is graded on a scale of 0-600 with 400 representing the minimum level of acceptable proficiency and 500 representing advanced proficient on the Algebra II exam (VDOE, 2012a). The instrument was developed to ensure that all students meet the minimum expectations in Algebra II. The Algebra II SOL exam specifically tests for content knowledge after the student has completed the Algebra I course work in either half year or full year format. This knowledge includes: expressions and

operations, equations and inequalities, functions and statistics. The minimum expectation for each core subject is clearly outlined in the Standards of Learning curriculum (VDOE, 2012a). Students participating in SOL testing are tested at the end of each semester or school year; there is no time limit for taking the SOL exam.

The VDOE reports the validity of the Algebra II SOL exam using a Cronbach's Alpha Coefficient. Each administration of the Algebra II SOL exam contains of three core exams. Each core contains a number of tests with inconsequential variations these are called forms. Each division is assigned one core (and the corresponding forms). The division also gets one alternate form, for students who are testing outside the regular test day for that division. Each division is given one Algebra II core exam from which all Algebra II exams during that administration are derived (VDOE, 2012b, p10). Data was available for the 2011-2012 testing cycle. This data indicates for the Algebra II SOL exam a Cronbach's Alpha Coefficient for core 1 of α=.91, core 2 α=.88 and core 3 α=.88 (VDOE, 2012b, p10). The VDOE refers to deKlerk (2008) who stated that with a range of 0-1 for alpha reliability coefficients, a value of 0.7 is considered acceptable and a value of 0.8 or higher is appropriate for high stakes testing (VDOE, 2012b, p. 46). All Algebra II core SOL tests meet this requirement. The Algebra II test scoring data is reported by the school division to the VDOE on an annual basis.

School-Facilitated Parental Involvement

Scoring for the school-facilitated parental involvement were found in the archival data from the VDOE statistics and reports, special education performance report. This 16-question survey instrument was mailed by the VDOE (beginning in the 2005-2006 school year) to the household of every student in Virginia who attended public school and had an IEP, and can be accessed by the general public through the VDOE.gov website by accessing the special

education tab. The mailed survey was sent with a self-addressed stamped envelope for return mailing, and directions were in English and Spanish along with a phone number to call for assistance with the survey. Follow up post cards were sent to those who received the survey to remind them to complete the survey (VDOE, 2013a). Parents who participated in this survey would read the question and check boxes to answers as they applied to the school division, and the individuals on the student's IEP team, there are no sub-scales or reverse questions in this survey. When the surveys were collected, the Avatar Institute of Measurement and the Virginia Commonwealth University (VCU) analyzed them. The Avatar Institute of Measurement utilized the Rasch measurement technology and related analysis methods to determine results (VDOE, 2006). For the 2012-2013, 2013-2014, and the 2014-2015 school years, this survey was only available online.

The parent survey was developed by the National Center for Special Education Accountability Monitoring (NCSEAM) at Virginia Commonwealth University for the VDOE. The purpose of this survey was to measure the percentage of parents who report that school-facilitated parental involvement was a means for improving services for their child with a disability (VDOE, 2006). The survey consisted of 16 questions, the first five of which were demographic information questions, the next 11 questions addressed school-facilitated parental involvement. On the online survey, there was a voluntary question number 17, which is an optional space for additional comments (Survey Monkey Inc., 2016). The survey used a Likert scale containing the following options: agree, disagree and not applicable (N/A). The survey also contained a link and a phone number for parent training information and family involvement information as well as a contact person and contact information for any questions parents have regarding the survey. The survey results were calculated by dividing the number of parents

reporting school-facilitated parental involvement as a means for improving special education services by the total number of respondents and multiplying that number by 100. Since the VDOE is only surveying parents of students who receive special education services on school-facilitated parental involvement as a means of to help develop a plan for their students, the topic of the survey would be relevant to all families asked to participate. Parents with more than one student receiving special education services were invited to complete the survey questions as they pertain to each child receiving services. The VDOE also stated that the data collected represented all disability and ethnic groups in the state, but may not necessarily match the demographics of the state. The VDOE is looking at other ways to implement the survey to get responses that more closely match state demographics (VDOE, 2013a). All responses to this survey are anonymous (Survey Monkey Inc., 2016).

Procedures

The first step was to obtain IRB permission (see Appendix). All data used in this study were archival from the VDOE website (http://www.doe.virginia.gov). All data were downloaded and saved to an external hard drive. Data for the Algebra I, Geometry, and Algebra II SOL pass rates was available as an Excel spreadsheet data for school-facilitated parental involvement was only available in a portable document format (PDF). Data for school-facilitated parental involvement was entered onto an Excel spreadsheet and transferred to the SPSS program. When the data were entered in Excel, a third party checked the data for accuracy.

Data for Algebra I SOL Pass Rate

Data for the Algebra I SOL pass rates was obtained from the doe.virginia.gov website using the customized student achievement report tool, which was found on the Department of Education website. When on that website, the researcher went to the SOL and testing tab that

was found on the left-hand margin of the homepage. This took the user to a page with the heading SOL & Testing, which led to the following page: http://www.doe.virginia.gov/testing/index.shtml. When that page opened, the researcher went to the right-hand margin tabs. Towards the bottom of the right-hand margin tabs there was a section called Teacher Direct. At the bottom of the first section of the Teacher Direct portion of this margin tab was a quick link entitled Assessment & Achievement Data; the researcher opened this quick link. This link took the user to a page titled Assessment & Achievement Data. In the first bolded section in the center of this page was a link to open a page for customized student achievement reports. The researcher opened this link to get to the page to build the customized achievement report to collect the SOL pass rate data for this study. When on this page the researcher used the following steps to create the customized data set needed for Algebra I SOL pass rate. The researcher selected the following values: checking the select student characteristics box, the researcher then used the select all option for students under race/ethnicity, in the gender box the researcher used the select all option for students, and in the grade box the researcher selected all grades. The researcher then checked the select student subgroups box where the researcher used the select all option in the economically disadvantaged box, the select all option in the limited English proficiency box, the select all option in the homeless box and yes in the disabled box, this brought up an additional box labeled disability type and the researcher selected all in this box. The researcher then checked the select test and subject box where the researcher selected EOC in the test level box, SOL in the test source box, mathematics in the subject area box, and Algebra I in the test box. The researcher then checked the select statistics to report box, scrolled down and selected pass rate. The researcher then checked the select school year(s), statewide, division or school box where the researcher first

selected the 2012-2013 school year, and in the report level box selected division on the drop-down menu. This selection brought up another box called division(s) and the researcher selected the top choice all divisions, then clicked submit on the bottom right hand corner of the blue box. This link brought up another section at the last check box where the report was started. The researcher then checked the top of the report to ensure that all values selected were being reported. The researcher then selected Excel as the option for the report, opened the report and saved it onto an external hard drive.

This process was repeated an additional 21 times (to collect demographic information) with the following changes: each additional time the report was run, the researcher collected statewide data (this was done by changing the report level box from division to state). In the first two additional reports the only variable that changed was gender, instead of all, the researcher ran two separate reports first selecting male, then female. The next 11 times the report was run, it was run for the individual disability categories. This was done by going to the disability type box in the select student subgroups section and a separate report was run for each individual disability category. The next eight times the report was run it was run for the individual ethnicity categories. This process, including the 21 additional reports, was repeated for the 2013-2014 and 2014-2015 school years.

Data for Geometry SOL Pass Rate

Data for the Geometry SOL pass rates was obtained from the doe.virginia.gov website using the customized student achievement report tool, which was found on the Department of Education website. When on that website the researcher went to the Standards of Learning (SOL) and testing tab that was found on the left-hand margin of the homepage. This took the user to a page with the heading Standards of Learning (SOL) & Testing, which took the

researcher to the following page; http://www.doe.virginia.gov/testing/index.shtml. When that page opened, the researcher went to the right-hand margin tabs. Towards the bottom of the right-hand margin tabs there was a section called Teacher Direct. At the bottom of the first section of the Teacher Direct portion of this margin tab was a quick link entitled Assessment & Achievement Data; the researcher opened this quick link. This link took the user to a page titled Assessment & Achievement Data. In the first bolded section in the center of this page was a link to open a page for customized student achievement reports. The researcher opened this link to get to the page to build the customized achievement report to collect the SOL pass rate data for this study.

When on this page the researcher used the following steps to create the customized data set needed for Geometry SOL pass rate. The researcher selected the following values: checking the select student characteristics box the researcher then used the select all option for students under race/ethnicity, in the gender box the researcher used the select all option for students, and in the grade box the researcher selected all grades. The researcher then checked the select student subgroups box where the researcher used the select all option in the economically disadvantaged box, the select all option in the limited English proficiency box, select all option in the homeless box and yes in the disabled box, this brought up an additional box labeled disability type and the researcher selected all in this box. The researcher then checked the select test and subject box where the researcher selected EOC in the test level box, SOL in the test source box, mathematics in the subject area box, and Algebra I in the test box. The researcher then checked the select statistics to report box, scrolled down and selected pass rate. The researcher then checked the select school year(s), statewide, division or school box where the researcher first selected the 2012-2013 school year, and in the report level box selected division

on the drop-down menu. This brought up another box called division(s) and the researcher selected the top choice all divisions, then clicked submit on the bottom right hand corner of the blue box. This brought up another section at the last check box where the report was started. The researcher then checked the top of the report to ensure that all values selected were being reported. The researcher then selected Excel as the option for the report, opened the report and saved it onto an external hard drive.

This process was repeated an additional 21 times (to collect demographic information) with the following changes: each additional time the report was run, the researcher collected statewide data (this was done by changing the report level box from division to state). In the first two additional reports the only variable that changed was gender, instead of all, the researcher ran two separate reports first selecting male, then female. The next 11 times the report was run, it was run for the individual disability categories. This was done by going to the disability type box in the select student subgroups section and a separate report was run for each individual disability category. The next eight times the report was run it was run for the individual ethnicity categories. This process, including the 21 additional reports, was repeated for the 2013-2014 and 2014-2015 school years.

Data for Algebra II SOL Pass Rate

Data for the Algebra II SOL pass rates was obtained from the doe.virginia.gov website using the customized student achievement report tool, which was found on the Department of Education website. When on that website the researcher went to the Standards of Learning (SOL) and testing tab that was found on the left-hand margin of the homepage. This took the user to a page with the heading Standards of Learning (SOL) & Testing, which took the researcher to the following page; http://www.doe.virginia.gov/testing/index.shtml. When that

page opened, the researcher went to the right-hand margin tabs. Towards the bottom of the right-hand margin tabs, there was a section called Teacher Direct. At the bottom of the first section of the Teacher Direct portion of this margin tab was a quick link entitled Assessment & Achievement Data; the researcher opened this quick link. This link took the user to a page titled Assessment & Achievement Data. In the first bolded section in the center of this page was a link to open a page for customized student achievement reports. The researcher opened this link to get to the page to build the customized achievement report to collect the SOL pass rate data for this study. When on this page the researcher used the following steps to create the customized data set needed for Algebra II SOL pass rate. The researcher selected the following values: checking the select student characteristics box the researcher then used the select all option for students under race/ethnicity, in the gender box the researcher used the select all option for students, and in the grade box the researcher selected all grades.

The researcher then checked the select student subgroups box where the researcher used the select all option in the economically disadvantaged box, the select all option in the limited English proficiency box, select all option in the homeless box and yes in the disabled box, this brought up an additional box labeled disability type and the researcher selected all in this box. The researcher then checked the select test and subject box where the researcher selected EOC in the test level box, SOL in the test source box, mathematics in the subject area box, and Algebra I in the test box. The researcher then checked the select statistics to report box, scrolled down and selected pass rate. The researcher then checked the select school year(s), statewide, division or school box where the researcher first selected the 2012-2013 school year, and in the report level box selected division on the drop-down menu. This brought up another box called division(s) and the researcher selected the top choice all divisions, then clicked submit on the bottom right

hand corner of the blue box. This brought up another section at the last check box where the report was started. The researcher then checked the top of the report to ensure that all values selected were being reported. The researcher then selected Excel as the option for the report, opened the report and saved it onto an external hard drive.

This process was repeated an additional 21 times (to collect demographic information) with the following changes; each additional time the report was run, the researcher collected statewide data (this was done by changing the report level box from division to state). In the first two additional reports the only variable that changed was gender, instead of all, the researcher ran two separate reports first selecting male, then female. The next 11 times the report was run, it was run for the individual disability categories. This was done by going to the disability type box in the select student subgroups section and a separate report was run for each individual disability category. The next eight times the report was run it was run for the individual ethnicity categories. This process, including the 21 additional reports, was repeated for the 2013-2014 and 2014-2015 school years.

Data for School-Facilitated Parental Involvement

Before collecting the data for school-facilitated parental involvement, the researcher examined the Excel spreadsheets generated for the Algebra I, Geometry, and Algebra II SOL pass rates for student with disabilities by division, and made a list by school year of each division that reported these SOL pass rates separately by students with disabilities. This created the list of Special Education Performance Reports that was examined. The researcher then accessed the Special Education Performance reports for these divisions and school years.

Data for school-facilitated parental involvement was found at the VDOE website http://www.doe.virginia.gov/. When the VDOE homepage was opened the researcher selected

the statistics & reports tab found in the left-hand margin of tabs. Selecting the Statistics & Reports tab opened a page called Statistics & Reports. When this page opened, the researcher went to the right-hand margin, under the program participation data section; there the researcher found a quick link for Special Education Performance Reports, the researcher selected this link. This took the researcher to a page entitled Special Education Report to the Public. When this page opened, there was a series of links by school year in the middle of this page. The researcher first selected the 2012-2013 tab. This opened a page with links to State Performance Plan/Annual Performance Report to the Public for each school division in the state. The researcher then opened the first link on the list of schools that reported the SOL pass rates by disability. This opened a portable document format (PDF) file; the researcher then downloaded the PDF file, and went back to the previous page and opened the PDF file for the next school division on the list. This was repeated until all the PDF files for the school division that reported SOL pass rates by disability in the 2012-2013 school year had been downloaded. This process was repeated for all school divisions that reported SOL pass rates by disability in the 2013-2014 and 2014-2015 school years.

When all of the PDF files were downloaded and saved, each individual PDF was opened, and an Excel spreadsheet was created with the information reported on Indicator 8 (parental report of school-facilitated parental involvement) of the Special Education performance Report. The Excel spreadsheet contained the following fields; school year, division name, and the percentage for Indicator 8 (parents who report school-facilitated parental involvement as a means of improving services for students with disabilities). That information was then taken from each PDF and entered onto the excel spreadsheet. A third party then checked the parental involvement spreadsheet to ensure that the percentages reported in Indicator 8 of the PDFs were

correctly transferred to the spreadsheet, and ensured all the divisions that were on the parental involvement spreadsheet were the same divisions that reported SOL pass rates by disability (and that there are none missing or no additional school divisions reported). When it was confirmed the parental involvement spreadsheet was accurate it was imported into SPSS so that the Pearson's *r*, or Spearman's Correlation could be run and data analysis completed.

Data Analysis

A Pearson Product Moment Correlation (Pearson's *r*) was selected for this study because the researcher was looking for a correlation, either positive or negative, between the variables and the strength of any correlation among school-facilitated parental involvement scores and Algebra I, Geometry, and Algebra II pass rates for high school students receiving special education services. The Pearson's *r* looks for a linear relationship between the variables (Green & Salkind, 2011). When a Pearson's r was not appropriate, a Spearman's Correlation was run. The archival data were collected and saved from the VDOE website. In the case of the SOL pass rates, data were available in an Excel spreadsheet, which were imported into SPSS. In the case of school-facilitated parental involvement rates, the data were downloaded in PDF form then transferred to an Excel spreadsheet by the researcher and checked for accuracy by a third party (Virginia Commonwealth University graduate, B.S. Mathematics), before being imported into SPSS. The researcher then tested the three assumptions required to run a Pearson's *r*, assumption of bivariate normal distribution, assumption of linearity, and assumption of bivariate outliers. The researcher examined a scatterplot of the scores of both the criterion and predictor variables to look for bivariate normal distribution (Warner, 2013). The researcher also examined a scatterplot of the scores of both the predictor and criterion variables to determine if they have a linear relationship (Warner, 2013). The researcher also examined a scatterplot and boxplot to

determine if there are any extreme bivariate outliers.

When it was determined the data has bivariate normal distribution, a linear relationship, and any extreme outliers were eliminated, Pearson's *r* statistical tests was run at the 95% confidence level (for each mathematics test and school year in the study) to determine if there was any correlation between pass rates and school-facilitated parental involvement. When a Pearson's *r* was not the appropriate test, a Spearman's Correlation was run.

CHAPTER FOUR: FINDINGS

Overview

Math achievement (on the ninth-grade level) is considered one of the leading factors for employment in occupations associated with middle class economics (Lerman, 2013). In Virginia, students demonstrate mastery of math skills through the Standards of Learning (SOL) exams. These exams are given annually from third through eighth grade, then at the end of course (EOC), either full year or semester format, for Algebra I, Geometry, and Algebra II. In order for students in Virginia to graduate with a standard diploma, they have to earn three math credits and pass one EOC math SOL exam, in order for a student to earn and advanced diploma, they need to earn four math credits and pass two EOC math SOL exams. This study was conducted to determine if there was any correlation between a school's school-facilitated parental involvement score and pass rates for students taking the Algebra I, Geometry, or Algebra II EOC SOL exams, and receiving special education services in Virginia. This chapter will present the findings of this study organized by research question, and within each research question, each null hypothesis will be discussed.

Research Questions

RQ1: Is there a relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ2: Is there a relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores for high school students receiving special education services in Virginia?

RQ3: Is there a relationship between school-facilitated parental involvement scores and

Algebra II Standards of Learning exam scores for high school students receiving special education services in Virginia?

Null Hypotheses

$H_0$1: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$2: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$3: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

$H_0$4: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$5: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$6: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

$H_0$7: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special

education services in Virginia for the 2012-2013 school year.

$H_0$8: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$9: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

Descriptive Statistics

A Pearson's *r* was run for any test and sub-group with a sample size of 66 or larger (see Table 1), which according to Gall, Gall and Borg (2007) is the minimum sample size for this test at a 95% confidence level. For groups where a Pearson's r was not appropriate, a Spearman's Correlation was run, which according to Warner (2013) is the appropriate test when scores do not meet the criteria for a Pearson's *r*. The minimum sample size for the Spearman's *r* is 44 for a medium effect size and 21 for a large effect size for testing with a statistical power of .7 with a .05 alpha level according to Gall et al. (2007). In this study, the Spearman's Correlation was run for the Algebra II test samples. For the Pearson's *r*, the only tests yielding any correlation was the 2013-2014 Algebra I *All* test, which had a Pearson's Correlation of .226 and a Significance of .020 and the 2014-2015 Algebra I female test that had a Pearson's Correlation of-.265 with a Significance of .029 (Table 1). For samples where the Spearman's Correlation was run, the only correlation was found in the 2013-2014 Algebra II *All* sample. For the largest, or *All*, categories of tests with large enough samples for statistical testing to run a Pearson's *r*, the means for the variables are displayed in Table 1.

For the Algebra II SOL exams, for all year, there were no *All* groups or sub-groups that

met the minimum sample size of 66. For these exams a Spearman's Correlation Coefficient was run on the *All* category for each year in this study.

Table 1

Pearson's r Correlation Means of the Variables

Group	Sample Size	Pass Rate Mean	SFPI Mean
2012-2013 Algebra I All	96	0.014	0.889
2013-2014 Algebra I All	106	0.226	0.02
2014-2015 Algebra I All	105	-0.061	0.539
2012-2013 Geometry All	90	-0.083	0.436
2013-2014 Geometry All	93	0.027	0.794
2014-2015 Geometry All	83	-0.005	0.963

Research Question One

RQ1: Is there a relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores for high school students receiving special education services in Virginia? The first research question was examined through the following null hypotheses:

$H_0$1: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$2: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$3: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special

education services in Virginia for the 2014-2015 school year.

Results

The researcher examined data for $H_0$1: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year and found the following results. For the category *All* that included all students with disabilities all genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 96 (see Table 2). A Pearson's *r* was run and a pass rate mean of 39.417 was calculated and a mean of 77.162 was calculated for the school-facilitated parental involvement. The Pearson's correlation of .014 with a significance of .889 was found, meaning that there was no significant correlation between the variables (Table 2). For this null hypothesis, the researcher had a large enough sample size to conduct seven additional tests in the following sub-categories: cognitive disabilities, economically disadvantaged no, economically disadvantaged yes, female, male, specific learning disability, and white non-Hispanic. No significant correlations were found in any of the sub-group testing. Therefore, the researcher failed to reject the first null hypothesis that there was no relationship between school-facilitated parental involvement scores and Algebra I SOL pass rates in 2012-2013 for students in Virginia who received special education services.

The researcher examined data for $H_0$2: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year and yielded the following results. For the category *All* that included all students with disabilities all

Table 2

Pearson's Product Moment Correlation Scores for SOL EOC Algebra I Exam 2012-2013

Group	Coefficient*	Significance
All	0.014	0.889
Cognitive	-0.041	0.716
Econ. Dis. No	-0.061	0.624
Econ. Dis. Yes	0.019	0.886
Male	-0.165	0.138
SLD	-0.09	0.425
White Non-Hispanic	-0.109	0.33

*Correlation is significant at the .05 level (2-tailed)

genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 106. A Pearson's *r* was run and a pass rate mean of 45.381 was calculated and a mean of 82.777 was calculated for the school-facilitated parental involvement. The Pearson's correlation of .226 with a significance of .020 was found, meaning that there was a significant correlation between the variables for the *All* test (Table 3). For this null hypothesis, the researcher had a large enough sample size to conduct six additional Pearson's *r* tests in the following sub-categories: cognitive disabilities, economically disadvantaged no, economically disadvantaged yes, male, specific learning disability, and white non-Hispanic. No significant correlations were found in any of the sub-group testing (Table 3). Therefore, the researcher failed to reject the second null hypothesis in all sub-groups tested, that there was no relationship between school-facilitated parental involvement scores and Algebra I SOL pass rates in 2013-2014 for students in Virginia who received special education services. For the *All* group, there was found to be a relationship among the variables with a Pearson's Correlation Coefficient of .226 with a significance of .020.

Table 3

Pearson's Product Moment Correlation for SOL EOC Algebra I Exam 2013-2014

Group	Coefficient*	Significance
All*	0.226	0.02
Cognitive	0.143	0.189
Econ. Dis. No	0.136	0.269
Econ. Dis. Yes	0.161	0.129
Male	0.162	0.12
SLD	-0.02	0.853
White Non-Hispanic	0.092	0.388

*Correlation is significant at the .05 level (2-tailed)

The researcher examined data for $H_0$3: There is no relationship between school-facilitated parental involvement scores and Algebra I Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year, and yielded the following results. For the category *All* that included all students with disabilities all genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 105 (see Table 4). A Pearson's *r* was run and a pass rate mean of 49.889 was calculated and a mean of 87.673 was calculated for the school-facilitated parental involvement. The Pearson's correlation of -.061 with a significance of .539 was found, meaning that there was no significant correlation between the variables (Table 4). For this null hypothesis, the researcher had a large enough sample size to conduct seven additional Pearson's *r* tests in the following sub-categories: cognitive disabilities, economically disadvantaged no, economically disadvantaged yes, male, female, specific learning disability, and white non-Hispanic. No significant correlations were found in any of the sub-group testing, with the exception of the female group, which had a

Pearson's Correlation Coefficient of -.065 with a significance of .029. Therefore, the researcher failed to reject the null hypothesis that there was no relationship between a school division's school-facilitated parental involvement score and Algebra I SOL pass rates for the 2014-2015 school year for students in in Virginia who received special education services. The only exception was the sub-test of female students. Researchers should be cautious interpreting and trends based on the negative correlation in the female sub-group testing, the 2014-2015 testing was the only group with a large enough sample to run a Pearson's *r* statistical test on the female sub-group for Algebra I.

Table 4

Pearson's Product Moment Correlation for SOL EOC Algebra I Exam 2014-2015

Group	Coefficient*	Significance
All	-0.061	0.539
Cognitive	-0.069	0.532
Econ. Dis. No	-0.11	0.371
Econ. Dis. Yes	-0.059	0.581
Female*	-0.265	0.029
Male	-0.084	0.428
SLD	-0.123	0.285
White non-Hispanic	-0.123	0.256

*Correlation is significant at the .05 level (2-tailed)

Research Question Two

RQ2: Is there a relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores for high school students receiving special education services in Virginia? The second research question was examined through the following null hypotheses:

$H_0$4: There is no relationship between school-facilitated parental involvement scores and

Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$5: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$6: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

Results

The researcher examined data for $H_0$4: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year, and yielded the following results. For the category *All* that included all students with disabilities all genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 90. A Pearson's *r* was run and a pass rate mean of 36.503 was calculated and a mean of 76.568 was calculated for the school-facilitated parental involvement. The Pearson's correlation of -.083 with a significance of .436 was found, meaning that there was no significant correlation between the variables (Table 5). For this null hypothesis, the researcher had a large enough sample size to conduct five additional Pearson's *r* tests in the following sub-categories: cognitive disabilities, economically disadvantaged no, male, specific learning disability, and white non-Hispanic. No significant correlations were found in any of the sub-group testing (Table 5). Therefore, the researcher failed to reject the null hypothesis that there was no relationship between a school divisions school-facilitated parental involvement score Geometry SOL pass

rates for the 2012-2013 school year for students in in Virginia who received special education services.

Table 5

Pearson's Product Moment Correlation for SOL EOC Geometry Exam 2012-2013

Group	Coefficient*	Significance
All	-0.083	0.436
Cognitive	0.08	0.506
Econ. Dis. No	-0.003	0.98
Male	0.002	0.984
SLD	-0.082	0.514
White Non-Hispanic	-0.023	0.848

*Correlation is significant at the .05 level (2-tailed)

The researcher examined data for $H_0$5: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year, and yielded the following results. For the category *All* that included all students with disabilities all genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 93. A Pearson's *r* was run and a pass rate mean of 37.834 was calculated and a mean of 82.371 was calculated for the school-facilitated parental involvement. The Pearson's correlation coefficient of .027 with a significance of .794 was found, meaning that there was no significant correlation between the variables (Table 6). For this null hypothesis, the researcher had a large enough sample size to conduct five additional Pearson's *r* tests in the following sub-categories: cognitive disabilities, economically disadvantaged yes, male, specific learning disability, and

Table 6

Pearson's Product Moment Correlation for SOL EOC Geometry Exam 2013-2014

Group	Coefficient*	Significance
All	0.027	0.794
Cognitive	-0.007	0.952
Econ. Dis. Yes	-0.132	0.275
Male	-0.044	0.701
SLD	0.027	0.825
White Non-Hispanic	-0.076	0.511

*Correlation is significant at the .05 level (2-tailed)

white non-Hispanic. No significant correlations were found in any of the sub-group testing (Table 6). Therefore, the researcher failed to reject the null hypothesis that there was no relationship between a school division's school-facilitated parental involvement score and Geometry SOL pass rates for the 2013-2014 school year for students in in Virginia who received special education services.

The researcher examined data for $H_0$6: There is no relationship between school-facilitated parental involvement scores and Geometry Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year, which yielded the following the results. For the category *All* that included all students with disabilities all genders, ethnicities, socio-economic statuses, and disability categories, there was a sample size of 83. A Pearson's *r* was run and a pass rate mean of 42.404 was calculated and a mean of 86.698 was calculated for the school-facilitated parental involvement. The Pearson's correlation of -.005 with a significance of .963 was found, meaning that there was no significant correlation between the variables (Table 7). For this null hypothesis, the researcher had a large enough sample size to conduct five additional Pearson's *r* tests in the following sub-categories:

Table 7

Pearson's Product Moment Correlation for SOL EOC Geometry Exam 2014-2015

Group	Coefficient*	Significance
All	-0.005	0.963
Cognitive	-0.073	0.560
Econ. Dis. Yes *	-0.248	0.042
Male	-0.093	0.449
SLD	-0.021	0.864
White Non-Hispanic	-0.028	0.818

*Correlation is significant at the .05 level (2-tailed)

cognitive disabilities, economically disadvantaged yes, male, specific learning disability, and white non-Hispanic (Table 7). No significant correlations were found in any of the sub-group testing except for the economic disadvantaged yes sub-group. This test yielded a Pearson's *r* score of -.248 and a significance level of .042. Therefore, the researcher failed to reject the null hypothesis that there was no relationship between school-facilitated parental involvement scores and Geometry SOL pass rates for the 2014-2015 school years for students in Virginia who received special education services. The only exception was the economically disadvantaged yes sub-group. Researchers should be cautious in determining a trend based on this negative correlation, in this study this sub-group had a large enough sample size to be tested for only two of the three years included in this study and only 2014-2015 showed a significant correlation. Additional years of a negative correlation would need to be seen in order to determine if this is a trend.

Research Question Three

RQ3: Is there a relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores for high school students receiving special education services in Virginia? The third research question was examined through the following

null hypotheses:

$H_0$7: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year.

$H_0$8: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year.

$H_0$9: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year.

Results

For $H_0$7: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2012-2013 school year, there was not a large enough sample size in the *All* category or any sub-category to run a Pearson's *r*, a Spearman's Rank Correlation Coefficient was run on the *All* category (sample size 44), which yielded a result of a correlation of .061 at a significance of .917 at a large effect size (Table 8). Therefore, the researcher failed to reject the null hypothesis that there was no relationship between a school division's school-facilitated parental involvement score and Algebra II SOL pass rates for the 2012-2013 school year for students in in Virginia who received special education services.

For $H_0$8: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2013-2014 school year, there was not a large enough

Table 8

Spearman's Correlation Coefficient for SOL EOC Algebra II Exam 2012-2013

Correlations

			PR	SFPI
Spearman's rho	PR	Correlation Coefficient	1.000	.016
		Sig. (2-tailed)	.	.917
		N	44	44
	SFPI	Correlation Coefficient	.016	1.000
		Sig. (2-tailed)	.917	.
		N	44	44

sample size in the *All* category or any sub-category to run Pearson's *r* testing, the *All* group had a sample size of 34, a Spearman's rank correlation was run on this test and resulted in a correlation coefficient of .361 at a significance of .036 at a large effect size (due to the sample size) (Table 9). This test found a significant correlation between the variables of school-facilitated parental involvement scores and SOL pass rates; therefore, the researcher may reject the null hypothesis that there was no relationship between a school division's school-facilitated parental involvement score and Algebra II SOL pass rates for the 2013-2014 school year, for students in Virginia who received special education services.

For $H_0$9: There is no relationship between school-facilitated parental involvement scores and Algebra II Standards of Learning exam scores of high school students who received special education services in Virginia for the 2014-2015 school year, there was not a large enough sample size in the *All* category or any sub-category to run a Pearson's *r*. A Spearman's Correlation Coefficient was run on the *All* group, which yielded a correlation coefficient of -.016 at a significance of .284 at the .10 alpha level at a large effect size (due to sample size) (Table

Table 9

Spearman's Correlation Coefficient for SOL EOC Algebra II Exam 2013-2014

Correlations

			PR	SFPI
Spearman's rho	PR	Correlation Coefficient	1.000	.361*
		Sig. (2-tailed)	.	.036
		N	34	34
	SFPI	Correlation Coefficient	.361*	1.000
		Sig. (2-tailed)	.036	.
		N	34	34

* Correlation is significant at the 0.05 level (2-tailed).

10). Therefore, the researcher failed to reject the null hypothesis that there is no relationship between a school division's school-facilitated parental involvement score and Algebra II SOL pass rates for the 2014-2015 school year for students in Virginia who received special education services.

In this study, the researcher ran a total of 43 statistical tests, which included 40 Pearson's Correlations and three Spearman's Correlations for statistical analysis. Among all the statistical testing, there were four tests, which showed a correlation among the variables these were: 2013-2014 Algebra I *All,* which had a Pearson's Coefficient of .266 at a significance of .020. Next was the 2014-2015 Algebra I female, which yielded a negative correlation of -.265 at a significance of .029. Then the 2014-2015 Geometry economically disadvantaged yes, which yielded Pearson's Correlation of -.248 at a significance of .042, and finally 2013-2014 Algebra II *All*, which resulted in a .361 Spearman's Correlation at a .036 significance level (at a large effect size due to sample size). In all other statistical analyses, the researcher was unable to reject the null hypotheses.

Table 10

Spearman's Correlation Coefficient for SOL EOC Algebra II Exam 2014-2015

Correlations

			PR	SFPI
Spearman's rho	PR	Correlation Coefficient	1.000	-.176
		Sig. (2-tailed)	.	.284
		N	39	39
	SFPI	Correlation Coefficient	-.176	1.000
		Sig. (2-tailed)	.284	.
		N	39	39

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

Parental involvement has been determined to be such an important factor influencing academic success for children with disabilities that it is mandated in the renewal of the *Individuals with Disabilities Education Act* (IDEA) (Burke, 2013). Research on this topic is very limited and the results have not been consistent. The purpose of this study was to determine if any relationship exists between a school-facilitated parental involvement score and math Standard of Learning (SOL) pass rates for high school students receiving special education services in Virginia. Focusing on school-facilitated parental involvement, SOL pass rates, and the current research, this chapter will be organized into the following sections: discussion, conclusion, implications, limitations, and recommendations for future research.

Discussion

Current law and regulations that have been put in place to secure free appropriate public education (FAPE) in a student's least restrictive environment (LRE) have developed and grown from previous laws and litigation over the past 150 years. In 2004, mandates for IDEA and the *No Child Left Behind* (NCLB) Act passed, which stated that children with disabilities must participate in statewide testing. The purpose of testing participation was to close the achievement gap between students with disabilities and their non-disabled peers (Esteves & Rao, 2008). IDEA also requires that an Individualized Education Plan (IEP) be developed for each student receiving special education services and that the student's parent consent to eligibility assessments and are involved in the development of the IEP.

The Virginia Department of Education (VDOE) defined school-facilitated parental involvement as arranging meeting at times when it is convenient for parents and informing

parents of their parental rights and encouraging parents to be involved in developing a plan for their child. This view was supported by Fan and Chen (2001) who stated that beyond the development of the IEP, research reflects inconsistency regarding the influence that parental involvement has on academic outcomes. This inconsistency in findings may be due to a lack of consistent definition of parental involvement. The Bobbett (1995) report, which discussed the state of Nevada's use of parental attendance at parent-teacher conferences as the measure of parental involvement, found that of the 23 facets examined, parental involvement had a negative impact on three, a positive impact on four and 16 facets were not impacted at all. Fishman and Nickerson (2015) found that specific teacher invitation and student requesting homework help were the biggest facilitators of parental involvement among well-educated parents in suburban upstate New York schools. This supports the findings of Burke (2013) who stated there is currently no effective model for parent and school collaboration for students receiving special education services. The 2013-2014 Algebra I *All* test did show a positive correlation between the variables, which may be explained by the findings of McDonnall et al. (2010), which stated the effects of parental involvement are greater in the lower grades. Since Algebra I is generally the first high school math course for students the effects of parental involvement would be highest on this group of test takers.

Parental involvement is considered to be such a key component to student success that it is mandated in IDEA (Burke, 2013). However there is no effective model asserting what is the most effective forms of parental involvement are, nor is there conclusive evidence that parental involvement has a positive impact on academic achievement for students with disabilities (Fan & Chen, 2001). Regarding the effects of parental involvement on math achievement for students with disabilities, one facet that needs to be considered is how society defines math achievement.

For the purpose of this study, math achievement was measured through the Virginia EOC SOL exams for high school math. However, Pappano (2014) discussed a disconnect with math among many students (not just students with disabilities). Students often equate doing well in math with being able to complete math problems quickly, and there is no relationship between the math that students are presented in class and how students use math in their world (Pappano, 2014). This disconnect may be even more evident for students with disabilities because there are no clear math trajectories for students with disabilities (Wei, Lenz, & Blackorby, 2012) and no evidence of how specific disability categories effect math achievement.

Jones, Wilson, and Bhojwani (1997) discussed factors that affect students with disabilities and stated one way to close the math achievement gap between students with disabilities and their non-disabled peers is to improve math education on the elementary level. However, math achievement gaps are based on more than whether or not a student has a disability. Gender, race, and socio-economic status are also factors that affect math achievement (Wei et al., 2012). Even though the research indicates these other factors affect math achievement, there is very little data collected by the VDOE on these sub-groups allowing educators to develop research-based methods to help close this gap.

Additionally, McDonnall et al. (2010) found the effect of parent involvement diminished as students progressed to higher grades; therefore, researchers should look for the most effective models to facilitate parental involvement in the earlier grades. This diminishing effect of parental involvement is supported by Epstein (1995), who found that in the higher grades parent-teacher partnerships seem to be less strong than in the lower grades and those communities with a higher socio-economic status appear to have stronger partnerships than communities with lower socio-economic statuses. McDonnall et al. (2010) also found that the strongest link

between parental involvement and higher mathematical achievement was for students in grades one through five. There was some carryover into high school math achievement for students whose parents were involved on the elementary level; however, there was no link found when initial parental involvement was in the middle school years, or when the involvement was strictly at home (i.e. homework help). Epstein concluded that, overall, families care about their children and want them to do well in school, but many schools are not sure how to involve parents in a meaningful way.

The results of this study support the current research on this topic on several grounds. First, there is no consistent definition of parental involvement being used by researchers, which may be leading to the mixed results that researchers are finding (Fan & Chen, 2001). The VDOE defined school-facilitated parental involvement as arranging meeting times when it is convenient for parents, informing parents of their parental rights, and encouraging parents to attend meeting and participate in planning (VDOE, 2002). Xu and Filler (2008) defined school-facilitated parental involvement as school created activities intended to create parental involvement generally giving the parent limited power, and Bobbett (1995) used parental attendance in the first parent teacher conference date of the school year as their measure of parental involvement. These differences in the definitions of the variables in the research may lead researchers to different conclusions in their research (Fan & Chen, 2001).

Overwhelmingly researchers agreed on the following points. The impact of parental involvement on student achievement is greater in the elementary school years than in the higher grades (Epstein, 1995; McDonnall et al., 2010). There is no model that is considered to be the most effective for facilitating parental involvement. Teacher preparation programs either do not focus on parental involvement at all, or focus on how to deal with dissatisfied parents (Burke,

2013). Other factors such as gender and socio-economic status affect math achievement for students with disabilities (Wei et al., 2012). Additionally, a lack of cooperation between schools and parents can lead to lower academic achievement and higher incidences of unwanted behavior in high school students (Al-Alwain, 2014).

Implications

The results of this study show that when using school-facilitated parental involvement as defined by the VDOE (arranging meeting times when it is convenient for parents, informing parents of their parental rights, and encouraging parents to attend meeting and participate in planning) (VDOE, 2002), there is no significant relationship between the parental reports of school-facilitated parental involvement and SOL pass rates for Algebra I, Geometry and Algebra II for high school receiving special education services in Virginia. Research question one investigated any relationship between school-facilitated parental involvement scores and Algebra I SOL exam scores for high school students receiving special education services in Virginia. This study did not find a statistically significant relationship between parent report of school-facilitated parental involvement and SOL pass rates for the Algebra I SOL in any of the 22 statistical tests run with the exception of the 2013-2014 Algebra I *All* test, and the 2014-2015 Algebra I Female test.

Research question two investigated any relationship between school-facilitated parental involvement scores and Geometry SOL exam scores for high school students receiving special education services in Virginia. The researcher ran 18 statistical tests for this research question. This study did not find any statistically significant relationship between the variables except for the 2014-2015 Geometry "Economically Disadvantage Yes" statistical testing, which showed a negative correlation between the variables.

Research question three investigated any relationship between school-facilitated parental involvement scores and Algebra II SOL exam scores for high school students receiving special education services in Virginia. In regards to this research question there were not enough samples available to run Pearson's *r* statistical testing to compare the variables. One implication

that may be implied is that there is a very low number of student receiving special education services who are taking and passing the advanced math classes and that educators should be encouraging students who receive special education services to take higher level math classes. For this research question the researcher ran a Spearman's Correlation for each of the *All* categories and found a correlation for the 2013-2014 Algebra II *All* category (at an alpha level of .10).

The overall implications of this study include the following points. In order to effectively evaluate the impact that parental involvement has on student academic outcomes, the VDOE may reconsider its parental involvement survey, so that it includes more information about what specific types of school facilitated parental involvement (SFPI) parents are experiencing beyond the defined SFPI that is asked about in the survey. This may help more accurately reflect what parents are actually experiencing. Furthermore, making the survey more accessible (such as offering it at the school or having it open for a longer period of time online) may increase the survey return rate, which may also reflect the SFPI rate more accurately. Additionally, as evidenced by the low sample size for the Algebra II tests, the VDOE may examine means to encourage more students with disabilities to participate in higher level math courses.

Limitations

Within this study are several limitations to consider. The first limitation is the low return rate on the special education parent survey, along with the inability to aggregate out subgroups of parents from the survey results. This limitation is being addressed by the VDOE by the distribution of post cards given to parents at IEP meetings to invite them to participate in the survey. According to Hank Millward (VDOE, July, 2016 phone conversation), the purpose of the post card is to invite parents to participate in the survey as well as give instruction on how to

access the survey. This low survey return rate may impact this study because the demographics of the returned survey may not mirror the demographics of the students receiving special education services. The second limitation was the low numbers of school divisions that report SOL pass rates by gender, socio-economic status, ethnicity, and individual disability category. This low number of reports may impact this study because there were not enough samples to complete statistical testing on any individual disability category other than SLD and the cognitive disabilities grouped together.

Recommendations for Future Research

Future research on this topic should include improved data collection for students who belong to the sub-group of students with disabilities and other sub-groups so that specific strategies can be developed to close the achievement gap. This data collection includes a survey that parents could participate in as a more direct follow-up to IEP meetings as well as a question specifically addressing what parental involvement opportunities interest them. Regarding the Special Education Parent Survey in place for the parents of student receiving special education services in Virginia, researchers may be able to develop more specific strategies from the information gathered if they could aggregate available data by information such as grade level, gender, and disability category. This survey does not currently address socio-economic status of the parents and including questions about socio-economic status may deter parents from completing the survey, which could reduce the survey return rate even further. Additional longitudinal research investigating case studies of individual disability groups may yield more specific results on what effect school-facilitated parental involvement has on student academic progress as well as what type of parental involvement yields the highest academic results for students with a disability.

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APPENDIX

IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

October 12, 2016

Allison Stein
IRB Application 2667: The Relationship between School-Facilitated Parental Involvement and Academic Math Achievement of 9th, 10th, and 11th Grade Students who Receive Special Education Services

Dear Allison Stein,

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

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

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

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

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